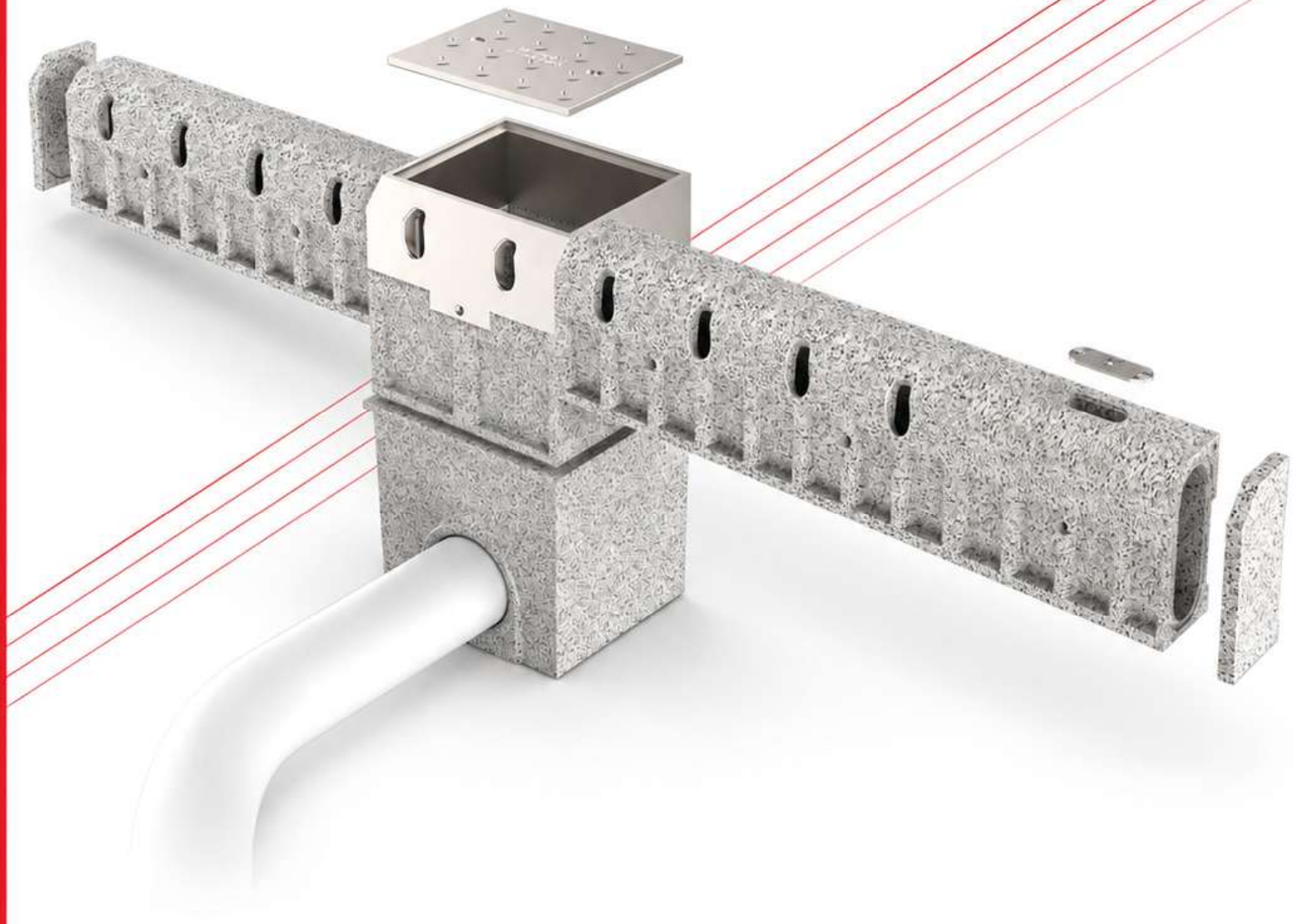
METUSAN

METUSAN YAPI ELEMANLARI SANAYİ ve TİCARET LTD. ŞTİ.

INSTRUCTIONS FOR INSTALLATION

MetuBord Drainage Systems



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1.PURPOSE AND SCOPE

This guide provides a practical installation method for METUSAN METUBORD polymer concrete drainage systems combined with kerb. It covers trench preparation, channel set-out, pipe connections, concrete encasement, finishing, final inspection and routine maintenance.

IMPORTANT Project-specific structural design, ground conditions, traffic intensity and local codes take precedence over generic details in this guide.

The installation method shall be selected according to the applicable load class, surrounding ground conditions, construction and intended use of the installation area.

The following load classes are covered by this guide:

Class	Test load	Typical application category
A 15	15 kN	Pedestrian / cycle areas
B 125	125 kN	Footways, pedestrian areas, car parking
C 250	250 kN	Kerbside / selected trafficked areas
D 400	400 kN	Roadways and areas used by road vehicles
E 600	600 kN	Ports, industrial areas, heavy load traffic

DESIGN NOTE Dynamic wheel loads, braking/turning forces, forklifts, heavy trucks and aircraft may require project-specific structural verification beyond the nominal EN 1433 class.

Product families covered

Family	Nominal series shown by Metusan	Details
METUBORD	Systems	Unit cover, unit upper & lower section, sump chamber
METUBORD	MB05	MB05310
METUBORD	MB10	MB10310
METUBORD	MBBL-MBBR	MBBL65-10 MBBR65-10
METUBORD	MBR	MBR05310

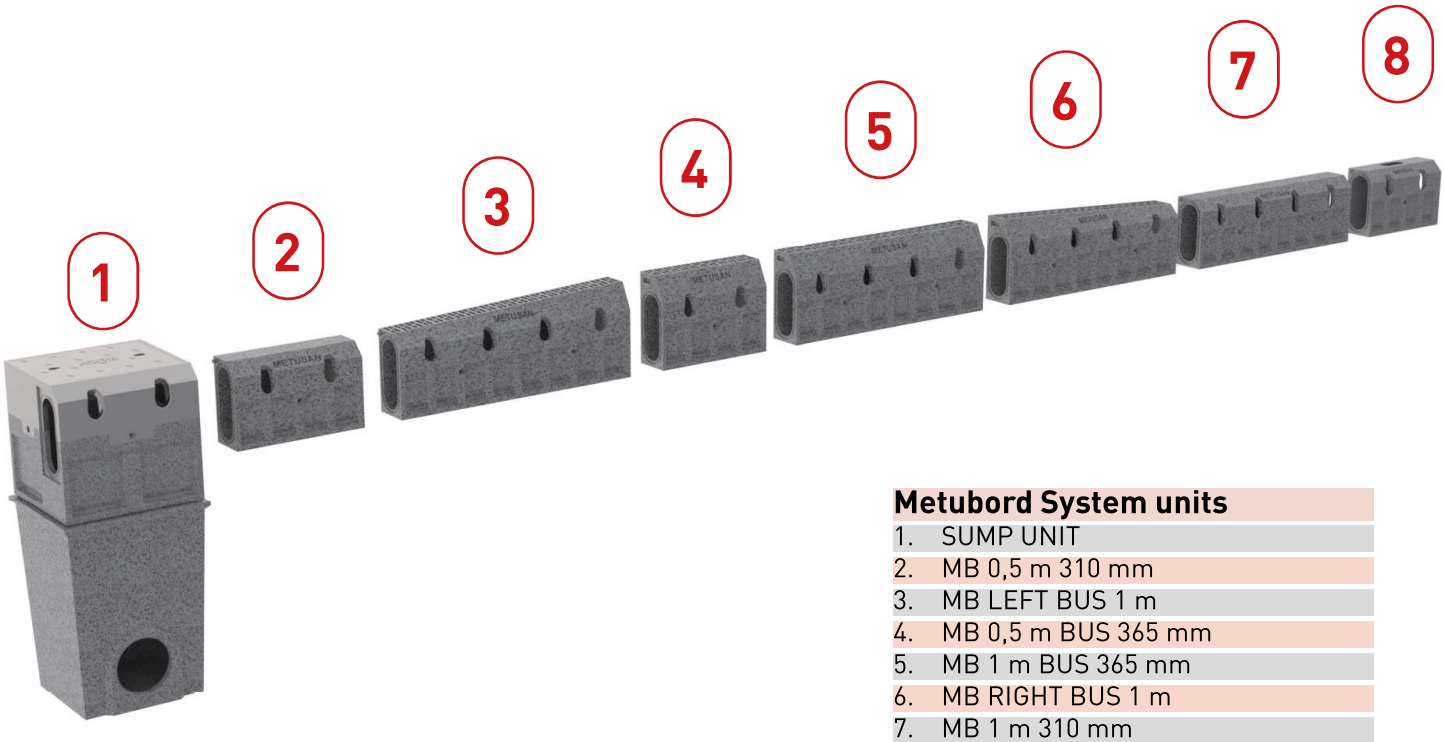
The requirements of the applicable project specifications or approved drawings shall take precedence where they impose requirements more stringent than those stated in this guide.

The installation shall be carried out by suitably trained personnel using safety equipment, appropriate tools, equipment and construction materials.

2.PRODUCT DESCRIPTION

The drainage system consists of polymer concrete monoblock channel bodies with sump and revision units according to the customer's needs.

The channel bodies are installed in sequence to form a continuous drainage line and must be installed on a suitable concrete foundation with the required alignment, level and slope.



Metubord System units
1. SUMP UNIT
2. MB 0,5 m 310 mm
3. MB LEFT BUS 1 m
4. MB 0,5 m BUS 365 mm
5. MB 1 m BUS 365 mm
6. MB RIGHT BUS 1 m
7. MB 1 m 310 mm
8. REVISION UNIT

3.UNLOADING AND HANDLING

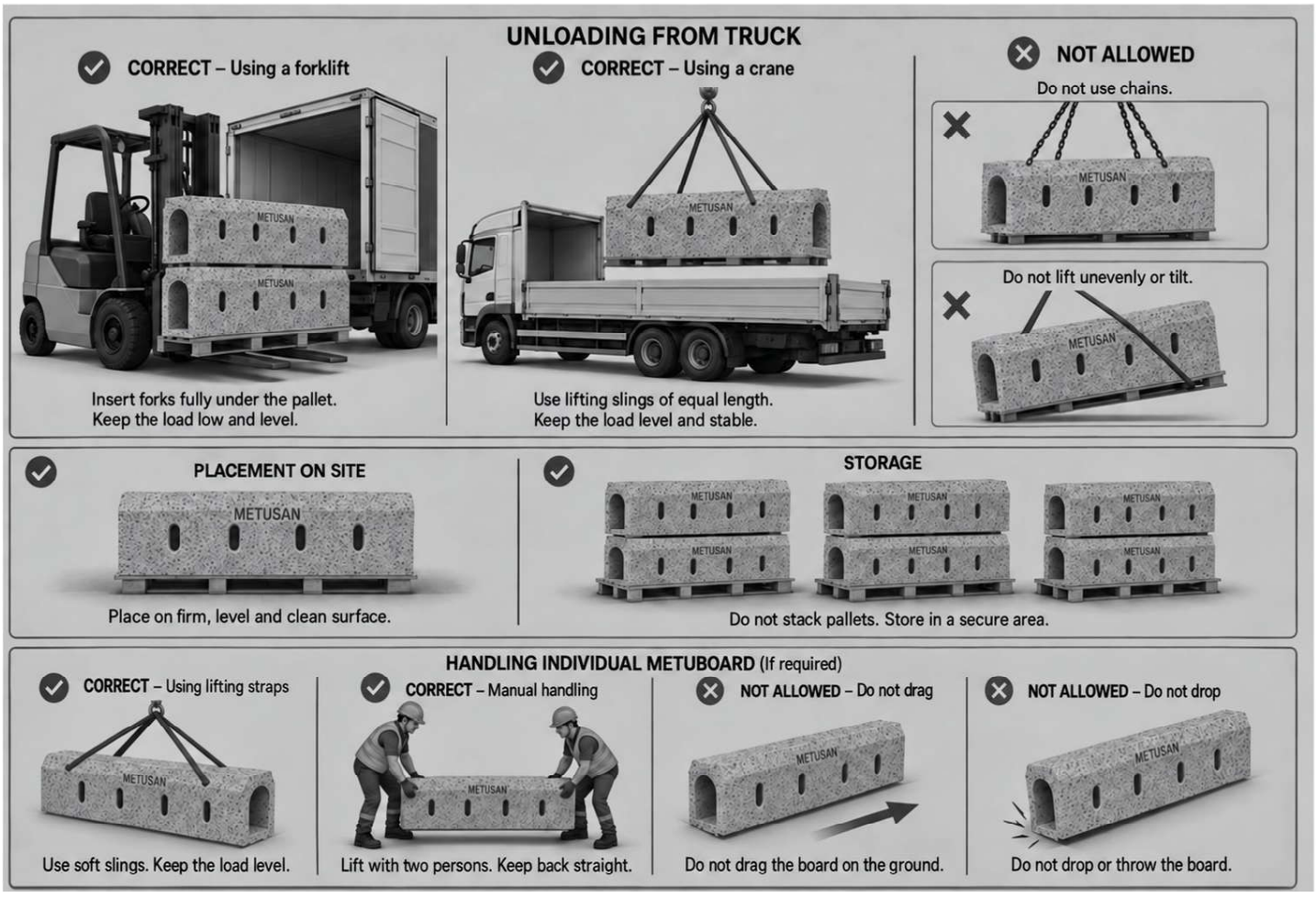
IMPORTANT The lifting method shall be suitable for the weight of the load. Personnel shall not stand underneath suspended loads.

NOTES

- Do not remove the bodies from the pallet by pulling or dragging.
- Check the condition of the pallet before lifting.

The channels are delivered on pallets. Handle with care to prevent damage to the bodies.

1. Before unloading, check the delivery and inspect the pallets for any visible damage.
2. Unload the pallets using lifting equipment with sufficient capacity.
3. Use a forklift with suitable forks or a crane with lifting slings.
4. Do not use chains or lifting equipment that may damage the channels.
5. Keep the pallets level during lifting and transportation.
6. Do not drop, drag or tilt the pallets.
7. Place the pallets on a firm, level and clean surface.
8. Do not stack pallets on top of each other.
9. Store the pallets in a secure area where they cannot slide, roll or be hit by vehicles.
10. If any body is found to be cracked, broken or significantly damaged, separate it from the undamaged channels and report it before installation.



4.SAFETY AND REQUIRED EQUIPMENT

Polymer concrete is a hard mineral-resin composite. Cutting, grinding or drilling may produce dust and fragments. Metal covers and edge components may also have sharp edges.



- Forklift or suitable lifting equipment
- Lifting straps/slings
- Measuring tape
- Level / laser level
- String line or chalk line
- Shovel and hand tools
- Compaction equipment
- Concrete placement and finishing tools
- Rubber mallet
- Suitable tools for applying the supplied bonding material

The following PPE shall be used as appropriate for the work being performed:



- Safety helmet
- Safety shoes/boots with protective toe caps
- High-visibility work vest or clothing
- Protective work gloves
- Safety glasses or goggles
- Hearing protection when working with noisy equipment
- Dust mask/respiratory protection when required by the site conditions
- Suitable protective clothing for concrete or bonding-material handling

IMPORTANT: All personnel shall comply with the applicable site safety rules and PPE requirements throughout the installation.

5.SITE PREPARATION

Before starting the installation:

1. Check the approved drawings and determine the drainage route, product type, required levels and flow direction.
2. Mark the channel centerline and the required finished level on site.
3. Confirm the location and level of the drainage outlet or connection point.
4. Ensure that the excavation area is clear of underground utilities, existing structures and other obstructions.
5. Remove loose soil, debris and unsuitable material from the installation area.
6. Make sure the ground is stable and suitable to support the concrete foundation.
7. Prepare the excavation to the required width and depth, allowing sufficient space for the concrete foundation and lateral concrete surround.
8. If the ground is soft, unstable or otherwise unsuitable, stop the installation and obtain instructions for the required ground improvement or additional support.
   The excavation and foundation dimensions shall be determined according to the project specifications, load class and site conditions.

6.EXCAVATION AND FORMATION PREPARATION

The excavation shall be carried out to the dimensions and levels specified in the approved project drawings. The trench shall provide sufficient width to allow the Metubord units to be correctly positioned, aligned, and adequately supported during installation.

The formation at the bottom of the excavation shall be firm, stable, and free from loose soil, standing water, organic material, and other debris. Any unsuitable or unstable material shall be removed and replaced with suitable compacted material in accordance with the project requirements.

The formation shall be prepared to the required level before placing the concrete foundation. Particular care shall be taken to ensure that the prepared formation provides continuous and uniform support for the foundation along the entire length of the Metubord installation.

Where groundwater or water accumulation is present, appropriate measures shall be taken to keep the excavation sufficiently dry during preparation and installation.

IMPORTANT: Do not install the body directly on loose soil or isolated hard points. Continuous and uniform support beneath is essential.

The required excavation dimensions and concrete foundation thickness shall be determined according to the load class, ground conditions and applicable installation detail.



7.CONCRETE FOUNDATION

1. Prepare the concrete foundation in accordance with the applicable channel load class and site conditions.

2. Refer to the foundation detail drawings provided at the end of this section for the required foundation dimensions and construction details for each load class.

3. The concrete used for the foundation shall have a minimum strength class of C30. A higher concrete class may be required where specified by the project requirements or site conditions. Heavy-duty installations, aggressive exposure conditions, or structural design requirements may require higher concrete strength and/or reinforcement.

4. Ensure that the formation beneath the foundation is firm, stable, and properly compacted before placing the concrete.

5. Pour the concrete foundation to the dimensions specified in the applicable load-class drawing, ensuring that the required width, thickness, level, and longitudinal slope are maintained.

6. The concrete foundation shall provide continuous and uniform support beneath the entire Metubord body. Ensure that no voids remain beneath the body after installation.

7. Set the top of the concrete foundation to allow the Metubord to be installed at the required finished level and longitudinal slope.

8. Before placing the Metubord body, inspect the foundation and confirm the correct:
- Level
- Alignment
- Longitudinal slope
- Width
- Surface condition

9. Remove any standing water, debris, loose material, or other contaminants from the foundation before installing the Metubord body.

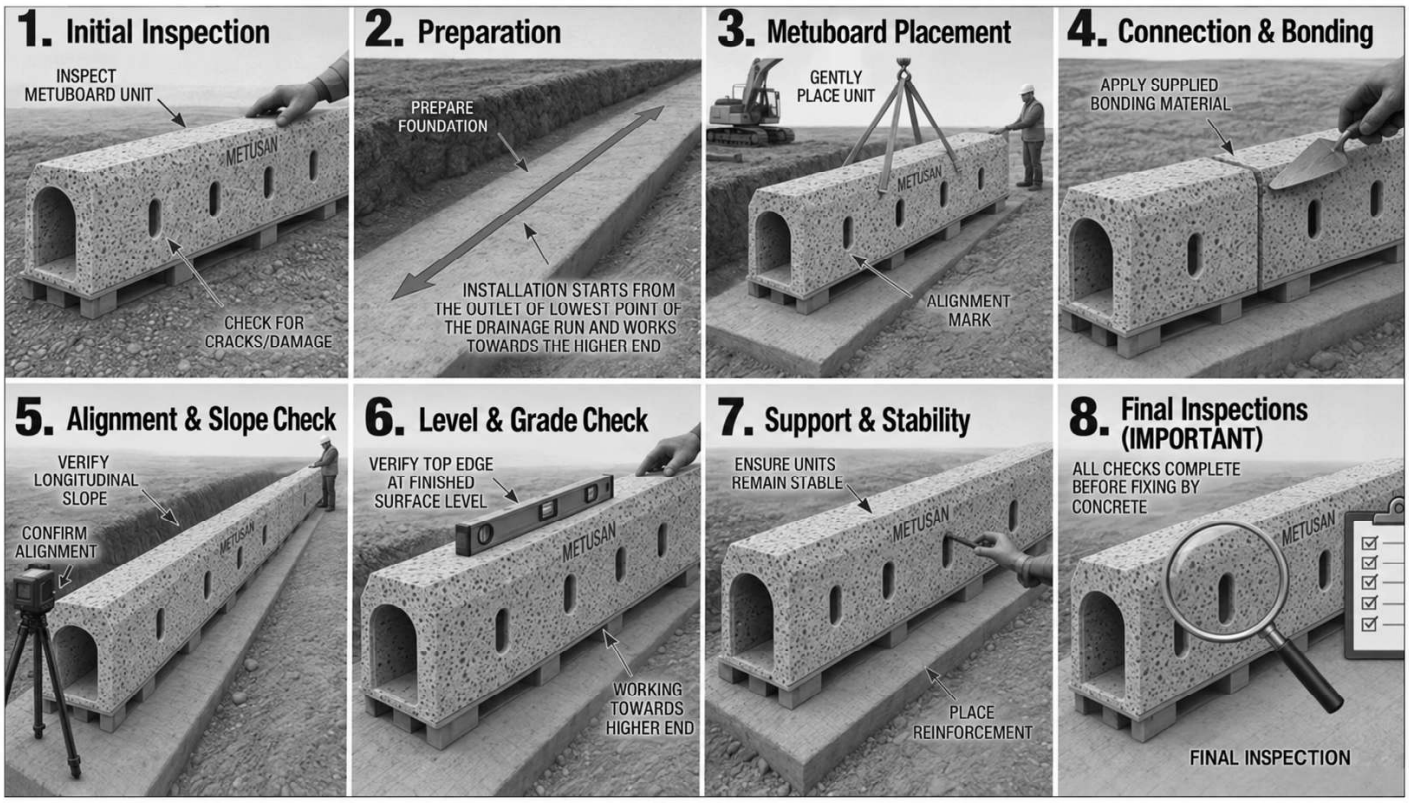
10. The foundation shall be sufficiently stable to prevent movement of the Metubord during installation and subsequent concreting.

IMPORTANT: The foundation dimensions shall not be reduced or modified on site. The applicable foundation detail shall be selected according to the channel load class and the intended installation area.

8.INSTALLATION AND ALIGNMENT OF METUBORD UNITS

1. Before installation, inspect each body for cracks, damage or deformation.
2. Start installation from the outlet or lowest point of the drainage run and work towards the higher end.
3. Check the product type and size before placing each unit.
4. Carefully place the product onto the prepared concrete foundation. Do not drop or drag it.
5. Ensure that the entire bottom surface is fully and continuously supported by the concrete foun dation.
6. Align MetuBord with the marked drainage route and centerline.
7. Before joining two channels, apply the supplied bonding material to the mating surfaces. (Si kaFlex 11FC)
8. Align both products and carefully push them together until fully seated.
9. Do not use excessive force, impact or heavy tools to make the connection. If the ends do not align correctly, separate them and check for dirt, debris or damage before reconnecting.
10. Check the alignment, level and longitudinal slope after positioning each channel and connection.
11. Make any necessary adjustments while the foundation concrete is still workable. Do not use excessive force or impact to position the channel.
12. Check that the top of MetuBord is at the required finished surface level and is properly aligned with the surrounding surface.
13. Continue installing the channels sequentially, checking the alignment, level and slope continuously throughout the drainage run.
14. Ensure that the channel units remain stable and do not move during subsequent concrete works.

IMPORTANT: All alignment, level, slope and connection checks shall be carried out during installation, before the channel is permanently fixed by the surrounding concrete. Do not proceed if any channel is incorrectly positioned.



8.1. JOINTING THE CHANNELS WHERE REQUIRED

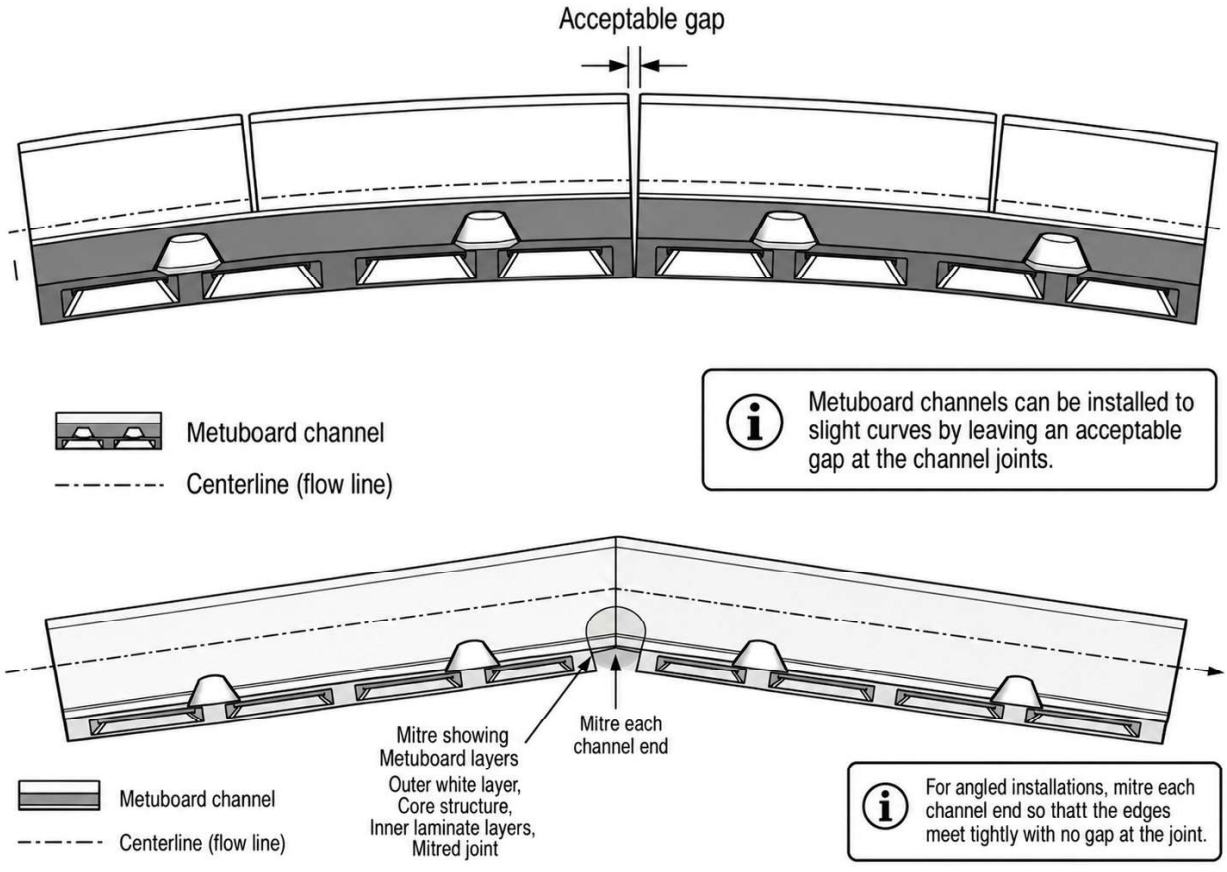


With or without cutting

1. To accommodate slight changes in direction, channels can be installed with a permis sible gap between adjoining channel sections. (Permissible gap to be approved by client / customer)

2. It is advised to prefer 900 joints and T's instead of cutting the channels so that gratings do not have to be cut

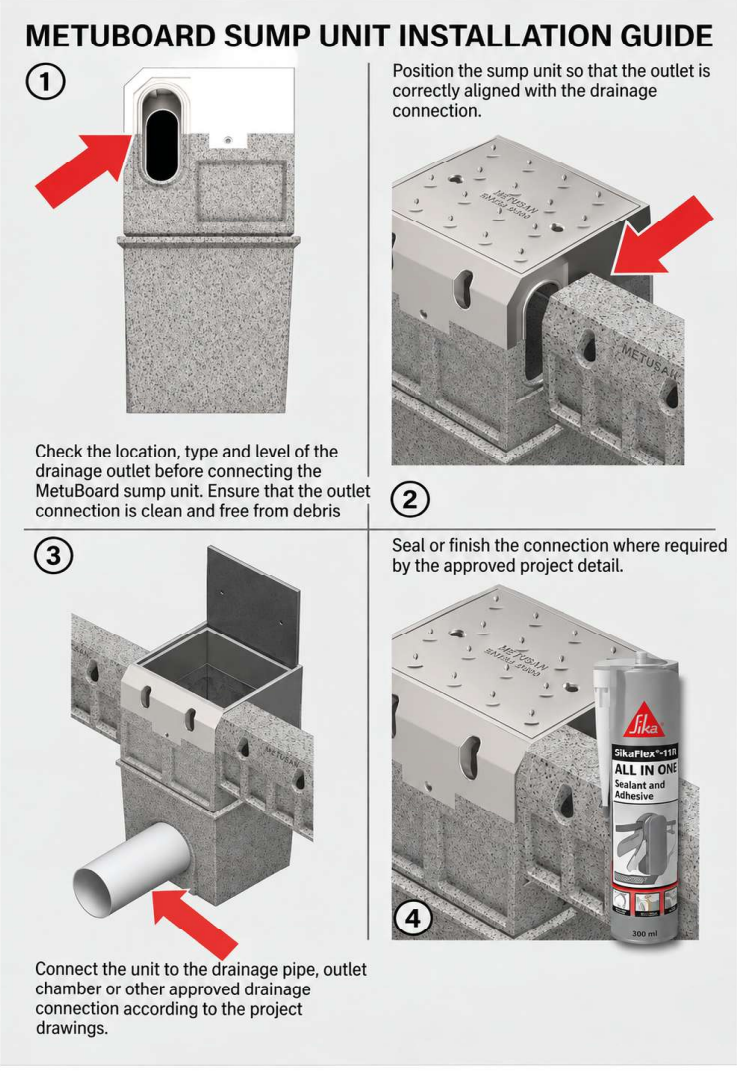
3. Mitred joints are achieved by cutting channels to the required dimensions and joining them together with Sikaflex 11FC or similar sealant.



9.INSTALLATION OF THE SUMP UNIT (OUTLET CONNECTIONS FIRST ALTERNATIVE)

1. Check the location, type and level of the drainage outlet before connecting the MetuBord sump unit. (Outlet connections are to be achieved by using the sump unit or the endcaps)
2. Ensure that the outlet connection is clean and free from debris.
3. Position the sump unit so that the outlet is correctly aligned with the drainage connection.
4. Check that the channel invert is at the required level and provides a continuous flow towards the outlet.
5. Connect the unit to the drainage pipe, outlet chamber or other approved drainage connection according to the project drawings by using open end caps.
6. Ensure that the connection is secure and does not restrict the flow of water.
7. Seal or finish the connection where required by the approved project detail.
8. Check the connection for any visible gaps, displacement or obstruction.
9. Remove any debris from inside the sump unit before proceeding with the concrete surround. Read also section 8 for extra advices on installing the MetuBord product family.

IMPORTANT: The outlet connection must not create a step or obstruction in the flow path. Ensure that water can discharge freely from the unit into the connected drainage system.



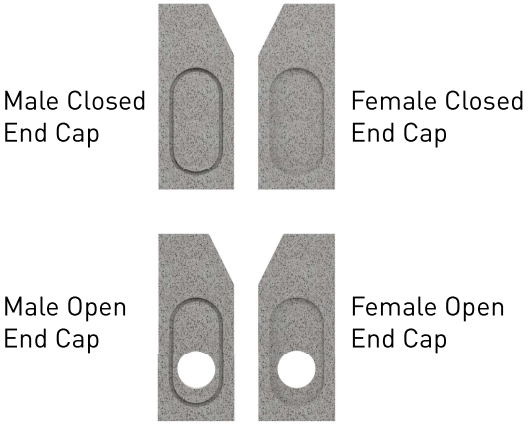
10.INSTALLATION OF REVISION UNITS

Follow section 8 for proper installation of the revision units.



11.INSTALLATION OF END CAPS

(Outlet Connections Second Alternative)





1. Choose the correct end cap according to your needs.

2. Choose the male closed end cap if it is to be used on a female end (and vice versa) and when there are no outlet connections to be assembled.

3. Assemble the end cap into the MetuBord body. Use the SikaFlex 11 FC sealant to complete installation.

4. Choose the open end caps for outlet connections.

Joint sealing

Where watertight or chemically resistant joints are required, clean and dry the joint surfaces before applying the specified flexible sealant (SIKAFlex 11 FC is recommended). Sealant type, primer and joint preparation must follow the sealant manufacturer's instructions and the project chemical-resistance requirement.

12.BACKFILLING AND SURFACE FINISHING

1. Before starting the surrounding surface works, ensure that the body is correctly positioned, aligned and secured according to the applicable installation detail.
2. Protect the body from damage during subsequent construction works.
3. Carry out backfilling and surrounding surface construction according to the appro ved project drawings and the required pavement construction.
4. Place backfill material in controlled layers and compact each layer appropriately.
5. Do not use heavy compaction equipment directly against the body.
6. Ensure that the finished surface is constructed to the required level in relation to the body.
7. The finished surface shall provide a smooth transition to the body and shall not crea te a step or obstruction to surface water flow.
8. Keep the body opening free from soil, concrete, asphalt and other construction materials during the works.
9. Remove any material that enters the body before proceeding with further construction.

IMPORTANT: Do not allow construction equipment, vehicles or stored materials to impact or load the body before the surrounding concrete and pavement have achieved sufficient strength.

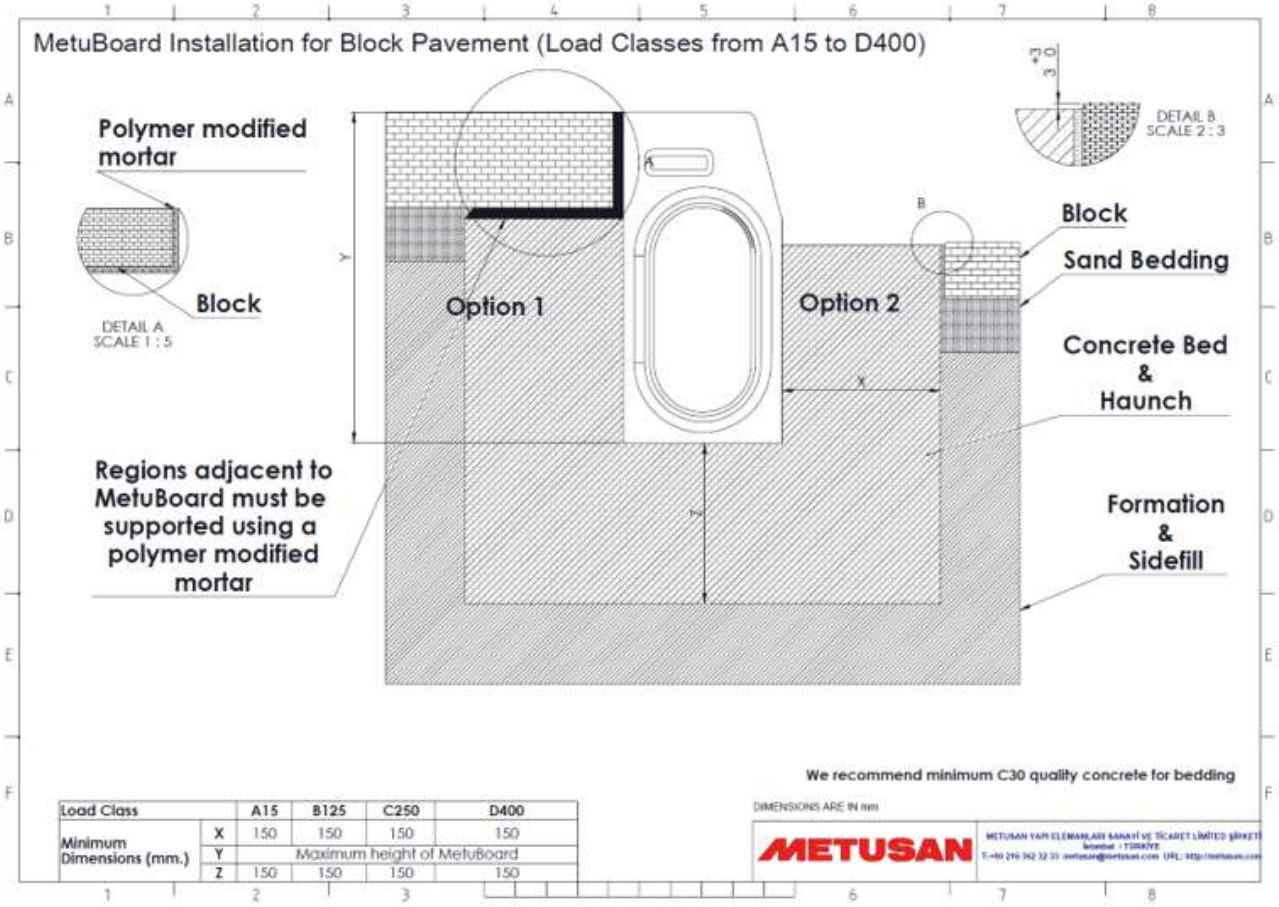
IMPORTANT: Installation is not considered complete until the final surfacing has been applied. During any temporary condition, site traffic must not cross the bodies. Loose boards, stone fill, or cover plates do not provide adequate protection for MetuBord.
Where a temporary crossing is required, the ground level should be raised locally to 3–6 mm above the top, extending 750–1000 mm on each side to form suitable ramps. The load class must be adequate to withstand the expected site traffic.

IMPORTANT: The body must be provided with adequate lateral support. Blocks installed directly against the body should be laid as a soldier course and securely restrained against movement by bedding them firmly on the concrete haunch. A polymer-modified mortar should be used for the bedding and perpendicular joints, such as RONAFIX Mortar Mix C or an equivalent.
Blocks or slabs laid on sand away from the body should be installed at a higher level to allow for potential settlement of the paving during service.

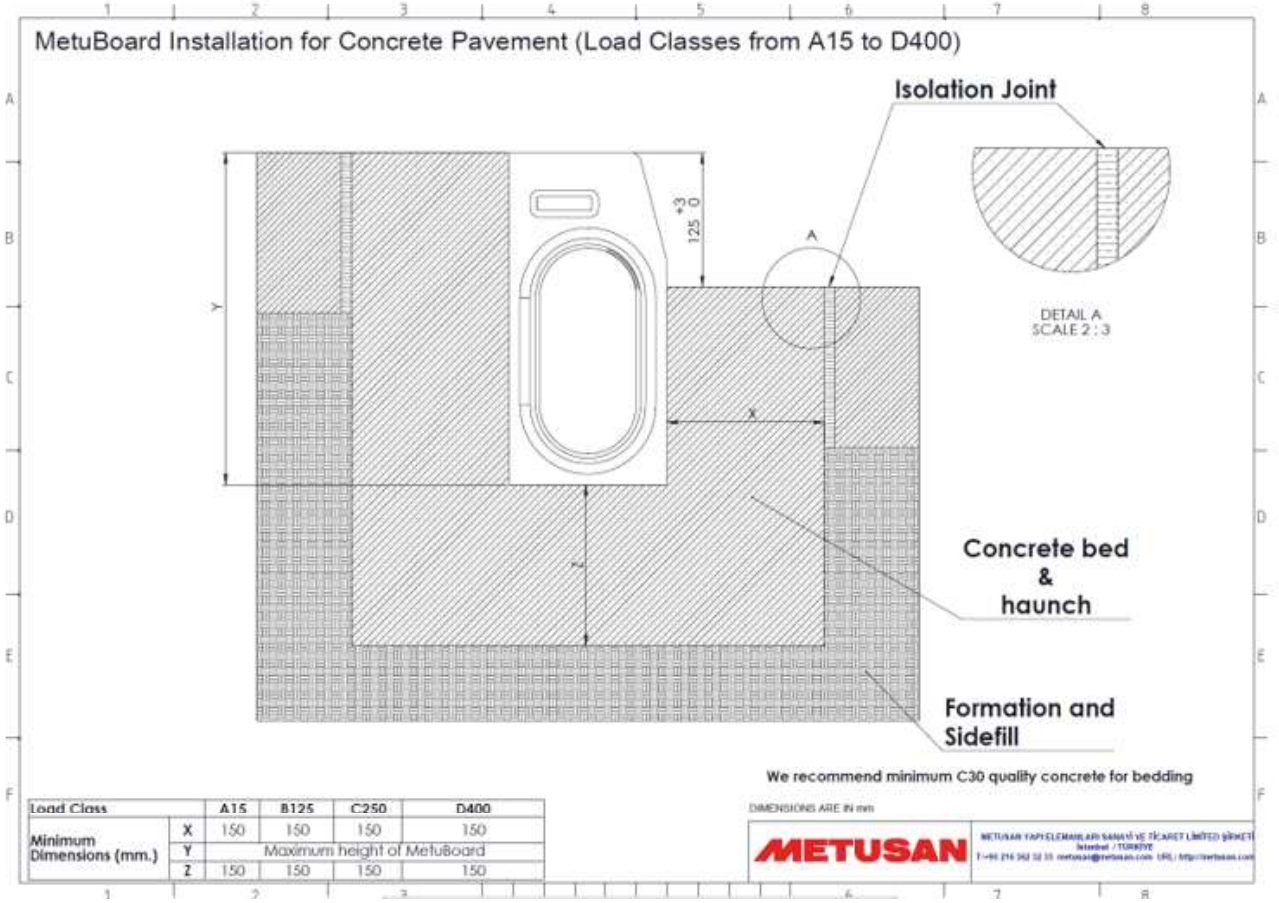
Details by Load Class
The following drawings provide the required construction details for the applicable load classes:

- A15
- B125
- C250
- D400
- E600

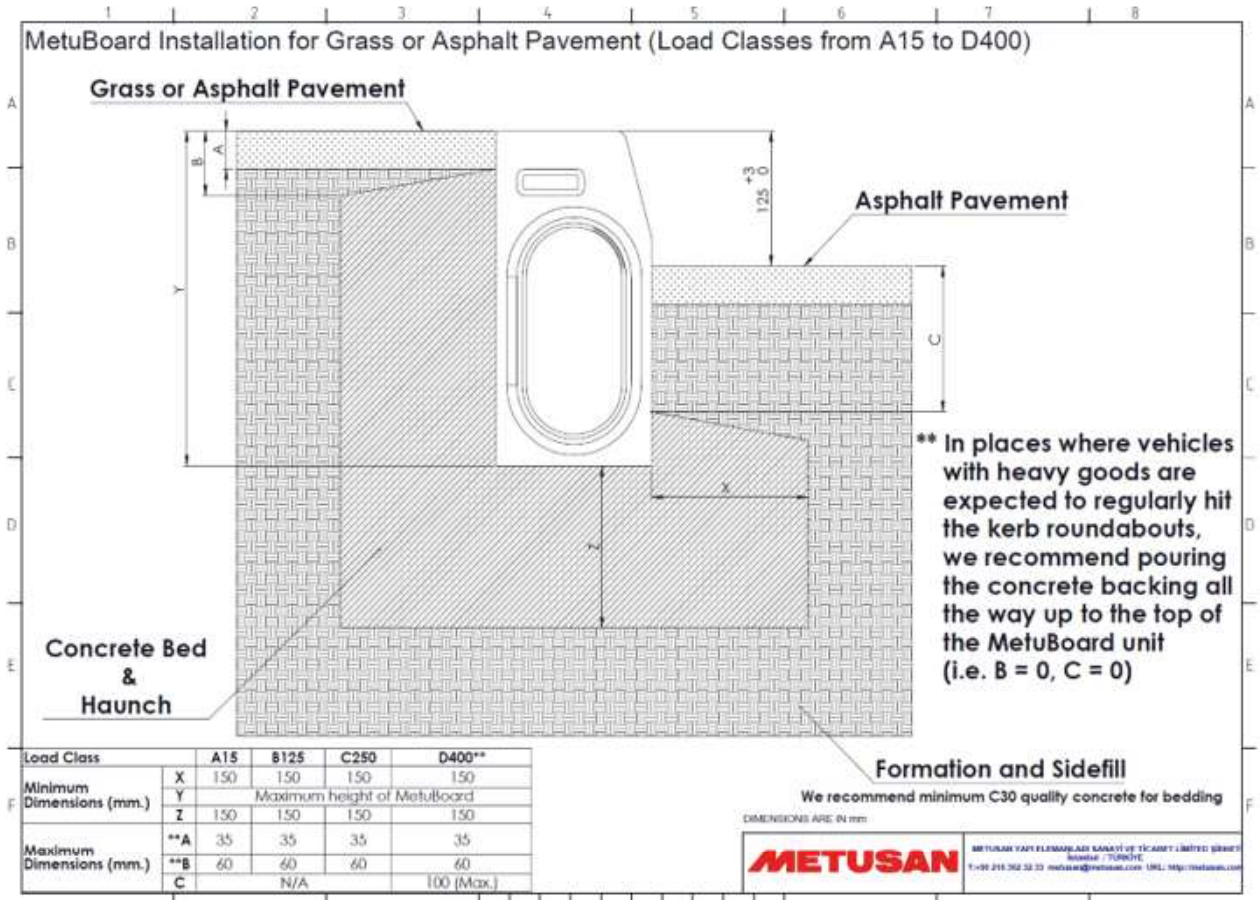
The installer shall use the drawing corresponding to the load class of the channel being installed.



Load Class		A15	B125	C250	D400
Minimum Dimensions (mm.)	X	150	150	150	150
	Y	Maximum height of MetuBoard			
	Z	150	150	150	150



Load Class		A15	B125	C250	D400
Minimum Dimensions (mm.)	X	150	150	150	150
	Y	Maximum height of MetuBoard			
	Z	150	150	150	150



Load Class		A15	B125	C250	D400**
Minimum Dimensions (mm.)	X	150	150	150	150
	Y	Maximum height of MetuBoard			
	Z	150	150	150	150
Maximum Dimensions (mm.)	**A	35	35	35	35
	**B	60	60	60	60
	C	N/A			100 (Max.)

Use the data below for Class E600 grass or asphalt pavement installations:

Load Class		E600
Minimum Dimensions (mm.)	X	Min. 150 mm.
	Y	Maximum height of Metubord (Less B where necessary)
	Z	Min. 150 mm.
	**A	Max. 35 mm.
	**B	Max. 60 mm.
	C	Max. 100 mm.

** In places where vehicles with heavy goods are expected to regularly hit the kerb roundabouts, we recommend pouring the concrete backing all the way up to the top of the Metubord unit (i.e., B=0, C=0)

13.CLEANING BEFORE FINAL INSPECTION

1. Remove all soil, concrete, mortar, asphalt and other construction debris from inside the channel.
2. Clean the channel bottom and ensure that the water flow path is completely clear.
3. Remove any temporary protective materials used during installation.
4. Check the installed drainage run for visible damage caused during the construction works.
5. Ensure that the outlet and all drainage connections are clear and unobstructed.
6. Confirm that the completed installation is clean and ready.

IMPORTANT: Do not leave construction debris inside the channel. The drainage path must be completely clear before the system is put into service.

14.FINAL INSPECTION

After the installation is completed, inspect the entire channel system before it is put into service. Check that all channels are correctly aligned, securely supported, and free from visible gaps or damage. Ensure that all outlet connections are properly sealed. Remove any excess bonding material, concrete, soil, or other debris from the channel. Confirm that the channel is clean and that water can flow freely through the system.

15.ROUTINE MAINTENANCE



Revision Unit



Sump Unit

Use the revision and sump units to clean the MetuBord systems. Annual clean-ups are usually idle but it is up to the end user to decide on the best time interval.

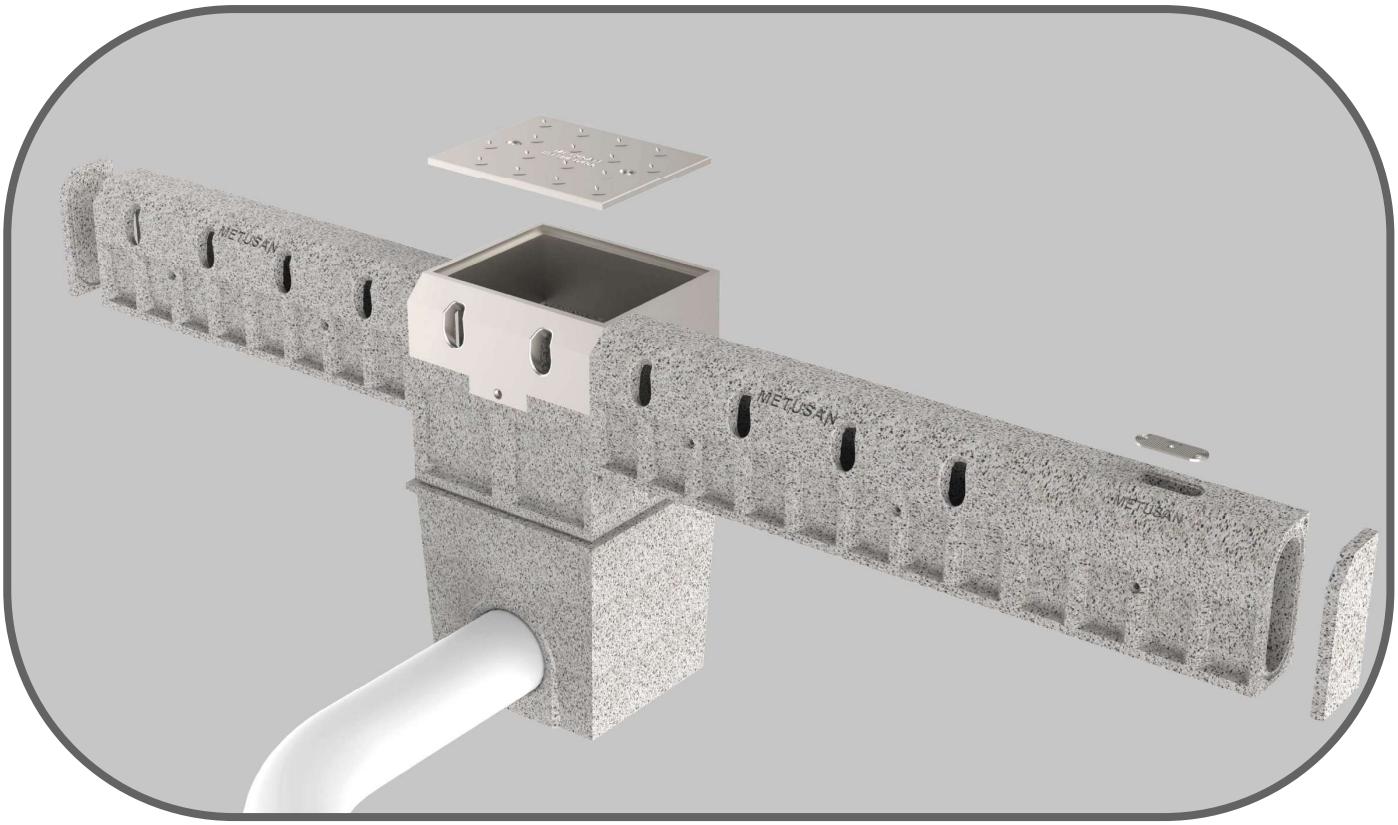
1. Remove the grating on top of the revision units. Keep the grating in a secure place during maintenance. You can remove the grating easily with the special tool that was delivered along with the product.

2. Open the access covers of the sump units.

3. Use a jetting head with adequate pressure (depends on the length of your system; should be around 80 to 120 bar) towards the direction of travel and insert a suction hose at the end of the cleaning line. Start both of the systems and adjust the pressure in order to prevent possible damage by spray back to property and escape of water. Take precautions not to damage property during process. (like placing boards on top of open covers etc.)

4. When the cleaning is completed, remove the hoses and make sure all the gratings and access covers are back to their places.





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