

Installation Manual

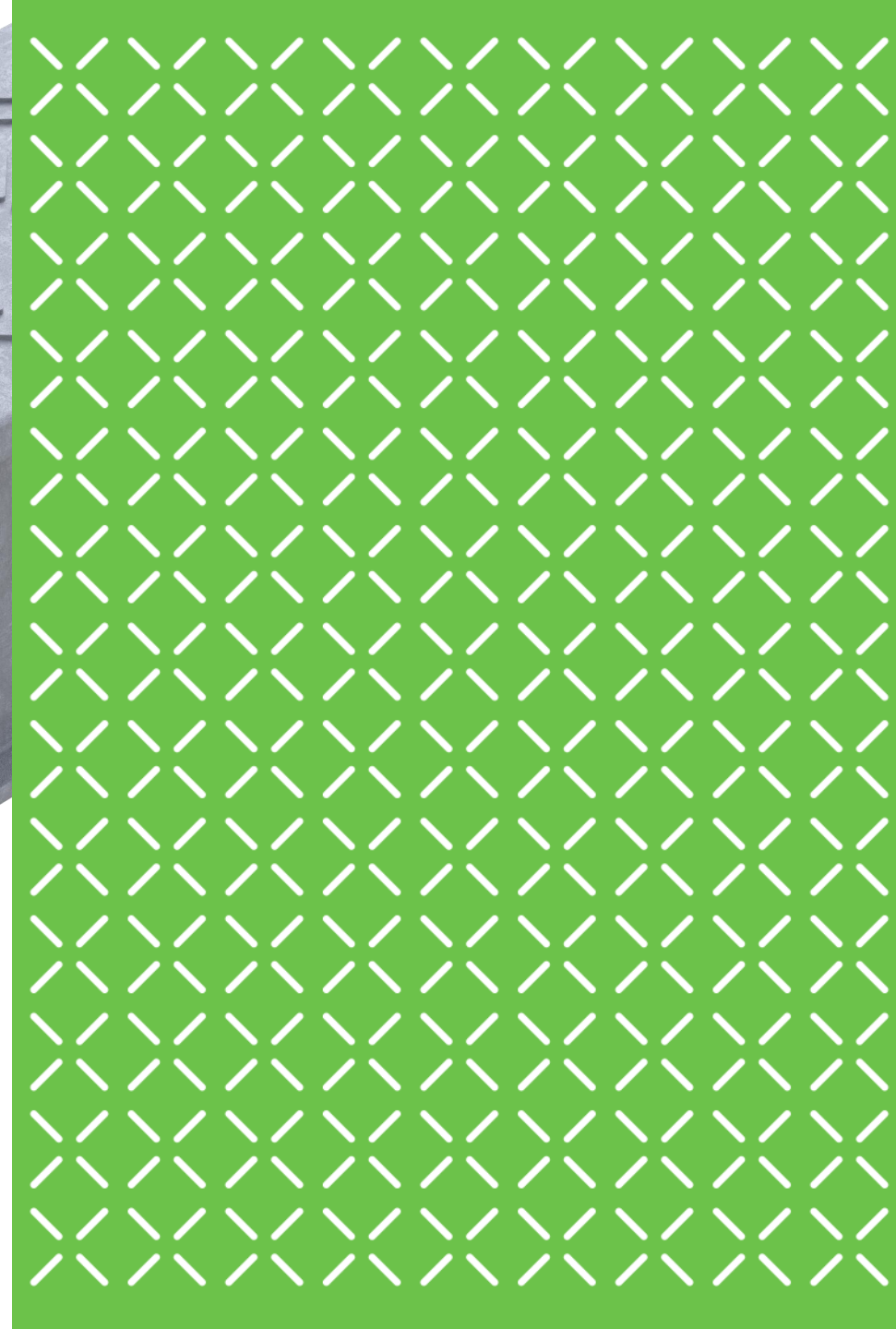


INTRODUCTION

This manual will provide an overview and guide for the installation of Green Trough and associated accessories.

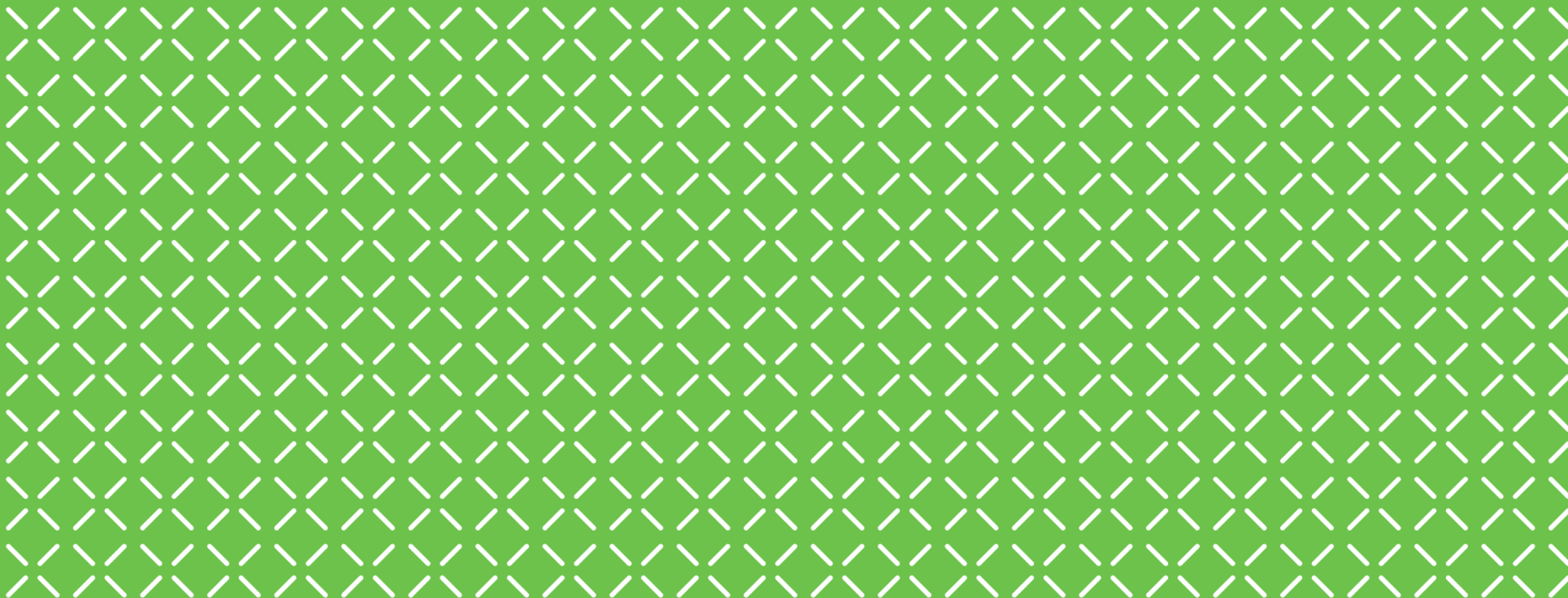
Green Trough is the world's most versatile cable trough system - a genuine concrete replacement.

Available in 6 sizes with an unparalleled range of accessories, Furukawa's Green Trough system offers the most innovative, environmentally friendly and state-of-the-art solution to cable route management. Green Trough recycled polymer cable trough is simple and fast to install thanks to its low weight and intuitive joining mechanism, and can be modified on site using basic hand tools.





4,000 tonnes of recycled household plastic waste is used to make Green Trough in one year. Equivalent to 268 million average-sized plastic bottles/containers.





CONTENTS

- 5 Safety notice
- 6 Product overview
- 7 Assembling Green Trough
- 8 Fixing the lid
- 9 Assembling Green Trough accessories
- 10 30 Degree bends
- 11 Optional divider
- 12 Recommended installation method
- 13 Adjusting the length
- 14-15 Elevated system
- 16-18 Walkway Green Trough



SAFETY NOTICE

Green Trough is lightweight compared to traditional concrete; however, care should be taken when handling the units
Do not throw the units.

Carry units by holding the base, not the lid. It is possible for the packing straps to break.

Avoid loads in excess of 10kN/1000mm on Green Trough lids

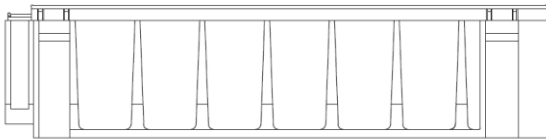
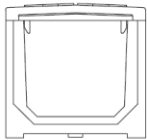
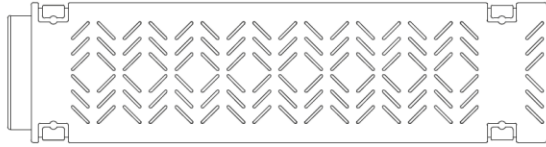
Take care when unloading pallets of Green Trough

Keep away from high heat and ignition sources

When manual processing Green Trough units ensure the correct cutting speed is used to avoid melting the plastic material

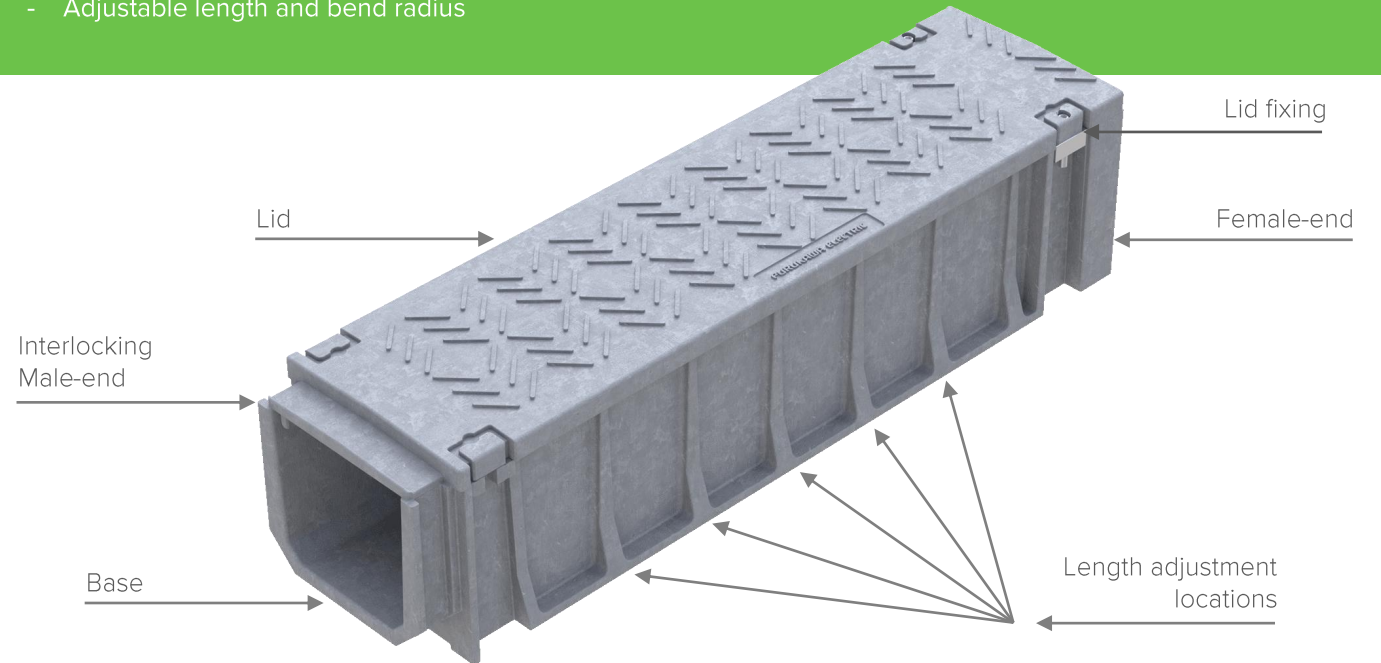
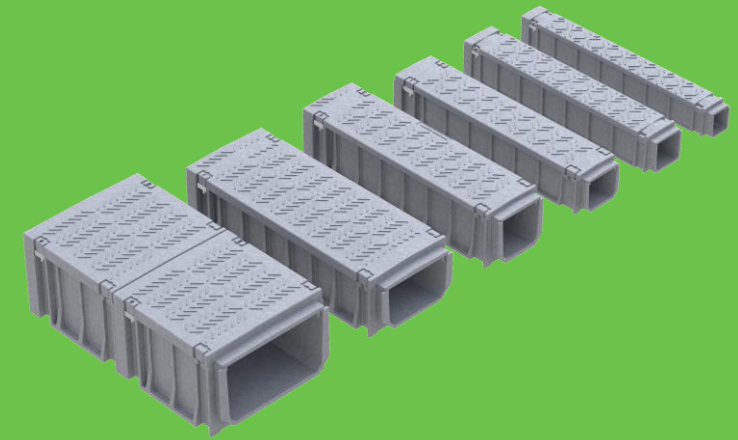
When manually processing, Green Trough will not create any fine dust, but it is still advisable to wear safety glasses

PRODUCT OVERVIEW



Series	mm				Length	Total Weight
	Width (Internal)	Width (External)	Height (Internal)	Height (External)		
G90	90	120	100	136	1000	7
G135	135	170	125	170	1000	10
150B	160	210	135	190	1000	13
200B	200	270	185	255	1000	21
300B	300	390	175	265	1000	29
430C	450	540	255	360	500	24

- Available in 6 sizes
- Supplied in 1m lengths except 430C (0.5m)
- Wide range of accessories available in all sizes
- All units are suitable for a 'one-man lift'
- Constructed from recycled household plastic (PE) waste
- Male/female interlocking flexible joints
- Secure stainless lid fixings
- Resistant to 50+ years of UV exposure
- Suitable for use between -40 and +80 degrees C
- K1 according to DIN 53438 fire standard
- Halogen free
- A15 cover loading
- Adjustable length and bend radius



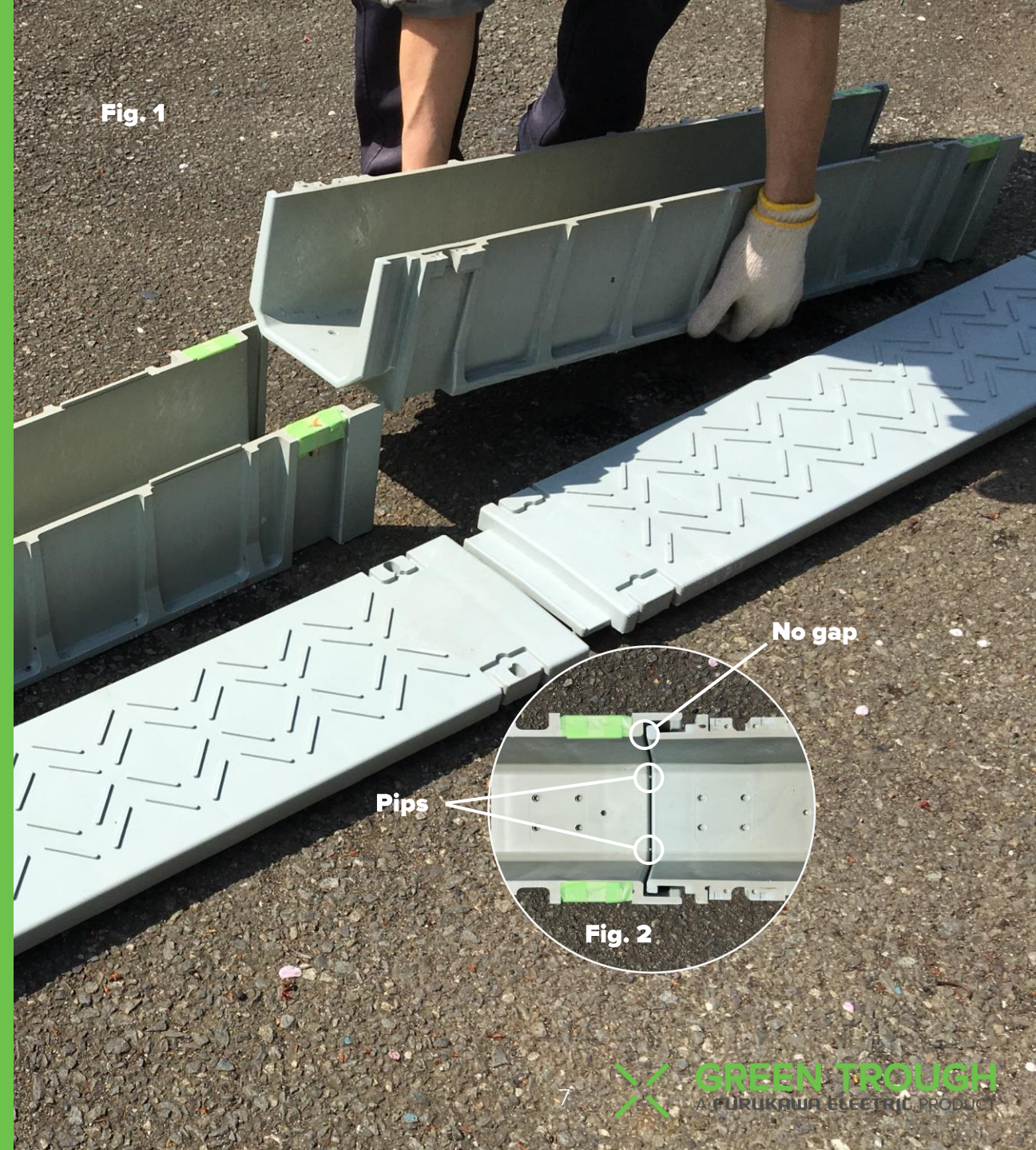
ASSEMBLING GREEN TROUGH

- 1 It is possible to install Green Trough on uneven ground due to its flexible interlocking joints. However, it is always recommended to install on a moderately flat surface. Green Trough units feature strong interlocking flexible units. Simply connect the male end to the female end of the adjacent unit as illustrated in fig. 1.
- 2 Ensure there is no gap between the Green Trough units when installed. Ensuring there is no gap eliminates the risk of damage due to thermal contraction. The two 'pips' in the joint are designed to crush in the event of thermal expansion (Fig. 2).
- 3 Attach the interlocking lids in the opposite direction to the installed base units. The lid fixing is at the female end and also holds the male end of the adjacent lid in place. The green tape covering the nut bodies should remain in place until lids are ready to be secured with screws when installation is complete.

NOTE

Avoid leaving the bases installed for a long time without lids fitted. Do not lay Green Trough on hot asphalt. Ensure the bed or trench is as flat as possible prior to laying Green Trough to avoid any possible disconnection.

Fig. 1



Pips

No gap

Fig. 2

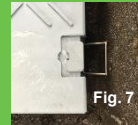
FIXING THE LID

CLASP TYPE

Clasps are delivered in separate box and must be connected by hand to the trough base.

Once installed, push the clasps by hand until they snap into place. To open the lid, simply use a flat head screwdriver.

Ensure there is at least 40mm space beside the trough lid once installed to ensure there is room for the clasp to open if required (Fig. 7).

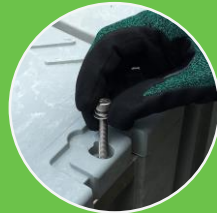


SCREW TYPE

Screws are delivered in a separate box, however the nut body is already attached to the trough base.

Use a 5mm hex tool to correctly seat the screws and hand tighten.

Tighten the screws to a maximum of 5.2 Nm using an electric drill or torque wrench.



NOTE

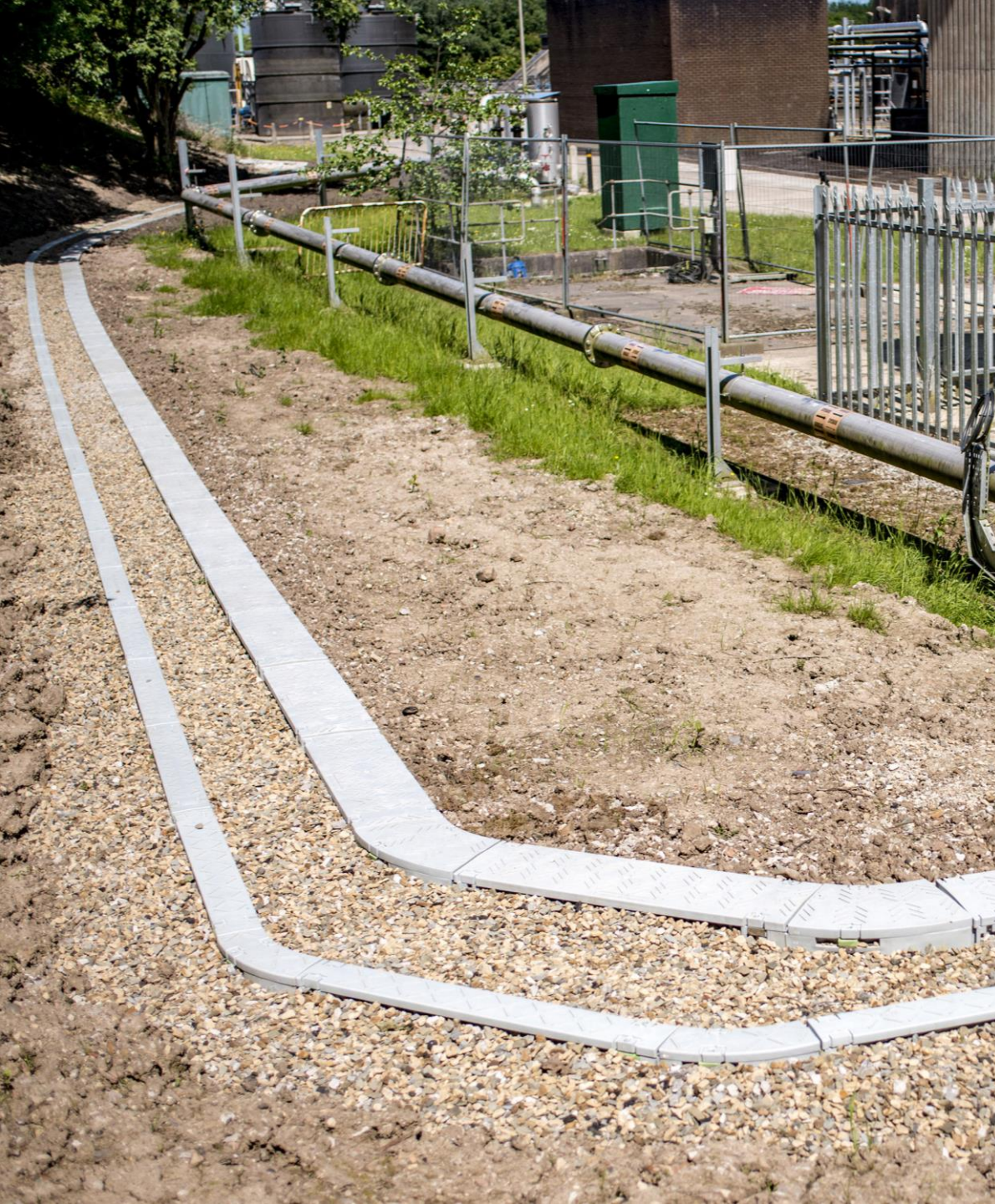
Ensure correct alignment of the lid hole and nut body in base before tightening the screw. Using a manual tool first, ensure the fixing is not cross threaded.

Do not over tighten as this can damage the trough or fixing.

In areas where there is excessive vibration the lid fixing should be checked for tightness periodically.

Only carry Green Trough units by holding the base, to avoid damaging the lid fixing.





ASSEMBLING GREEN TROUGH ACCESSORIES

Green Trough accessories such as bends and T-junctions can be connected in either direction thanks to all female connections (Fig. 3) and included adapter consisting of 2 pieces (Fig. 4). Simply insert the adapter as illustrated (Fig. 5).



Fig. 3

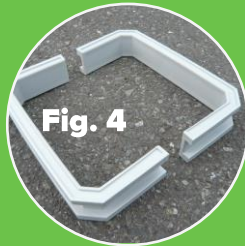


Fig. 4

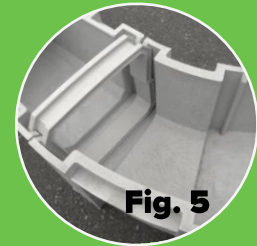


Fig. 5



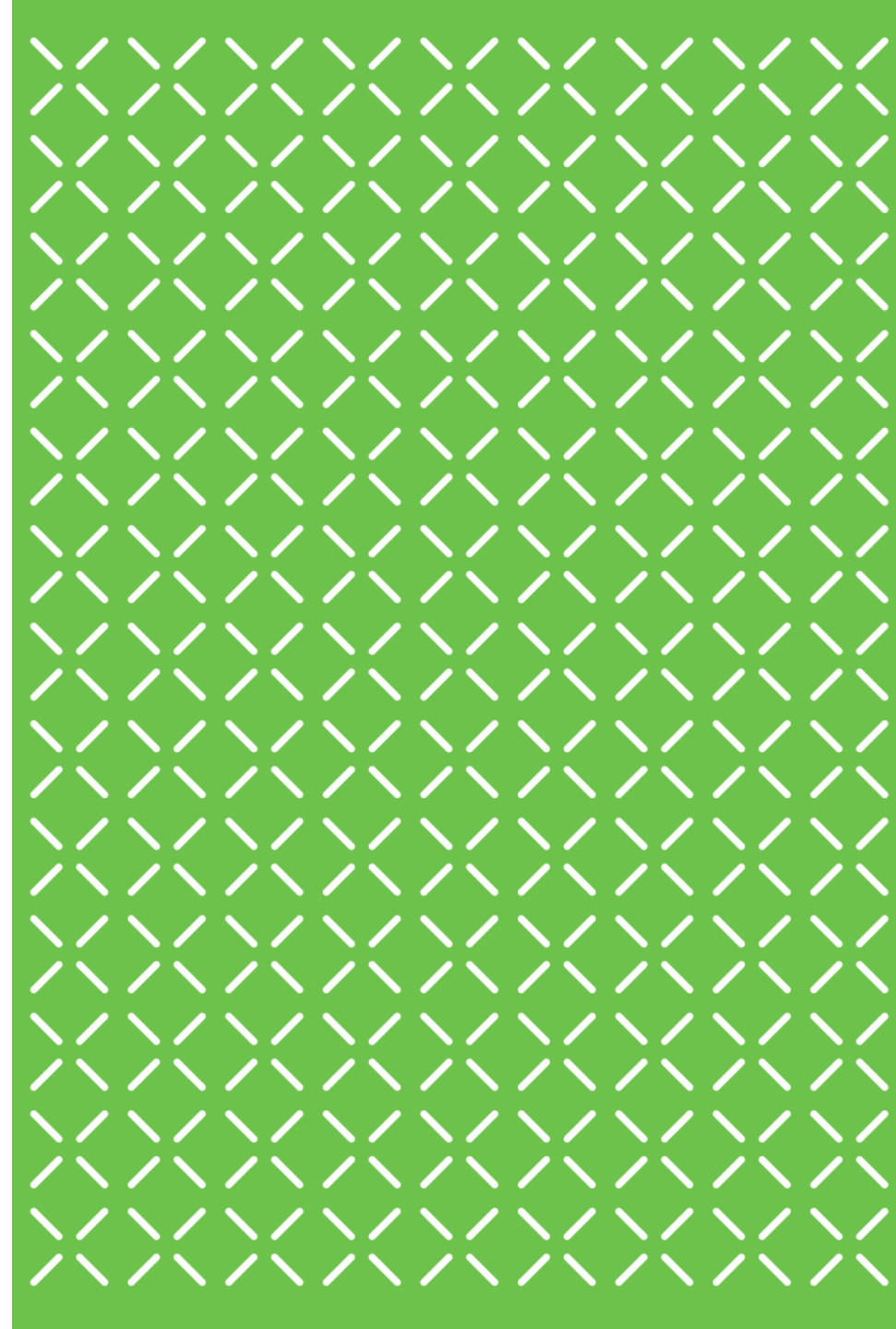
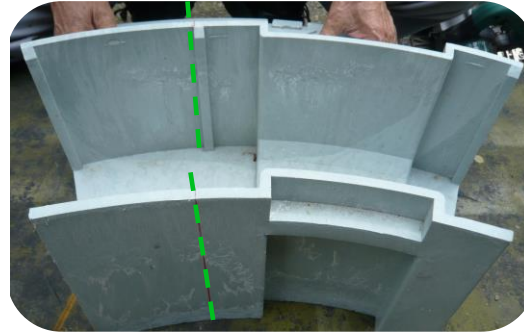
30 DEGREE BENDS

Green Trough bend units can be adjusted manually on site to create 30 degree bends. The units are designed to make this process quick and simple.

- 1 Cut the base of the bend unit at the predefined point, along the outer edge.
- 2 Adjust the lid to the same length.
- 2 This is your 30 degree bend which has exactly the same functionality as the pre fabricated 45 degree bend unit.

NOTE

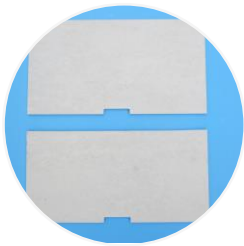
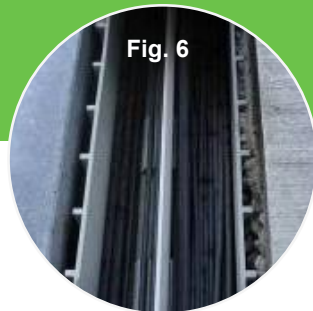
90 and 135 straight units cannot be processed in this way and require manual modification on site.



OPTIONAL DIVIDER

G135, 150B, 200B, 300B and 430C Green Trough can be supplied with dividing walls and holders when cable separation is required. On Straight units the holder comes built-in to the bottom of the base unit. The dividing wall can simply be inserted into the desired slot(s) creating 2, 3 or 4 channels (Fig 6).

For accessories (non-straight units) it is necessary to use an optional divider holder which is placed into the units by the installer. Specially designed dividing walls for bends are inserted into the divider holder.



GREEN TROUGH
A FURUKAWA ELECTRIC PRODUCT

RECOMMENDED INSTALLATION

Furukawa recommends installing Green Trough units directly onto the ground surface, or buried up to lid level as illustrated in Fig 8.

Green Trough can be completely buried, however, the loading capacity of Green Trough cannot be guaranteed with this method.

Furukawa recommends using steel plates or subterranean ducts such as EFLEX in areas where regular access is required by vehicles.

If installing on top of the ground surface, it may be necessary to secure the units in place, to avoid possible movement from external forces.



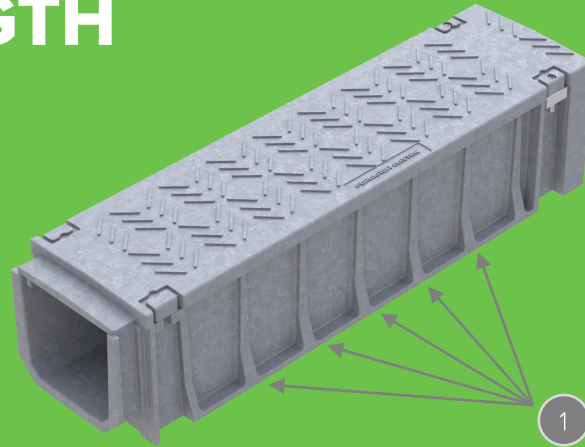
Fig. 8

It is recommended to bury up to the bottom of the lid

ADJUSTING UNIT LENGTH

Green Trough unit length can be adjusted manually by the installer using a circular or manual saw. The user can create a new male end at 125mm intervals along the length of straight units.

- 1 Select the cut location depending on the length required.
- 2 Cut the unit along the male side of the chosen rib, using the rib as a guide. The male end of the base unit is scrapped.
- 3 Cut off the bottom corners of the newly cut base piece.
- 4 Ensure that the newly processed base unit appears as pictured. This is your new male end connector.
- 5 Insert the newly processed base unit into the female end of the adjacent complete unit.
- 6 Cut off the male end of the lid so that the remaining female end piece is the same length as the newly processed base. Fix the female end lid piece to the base as usual.

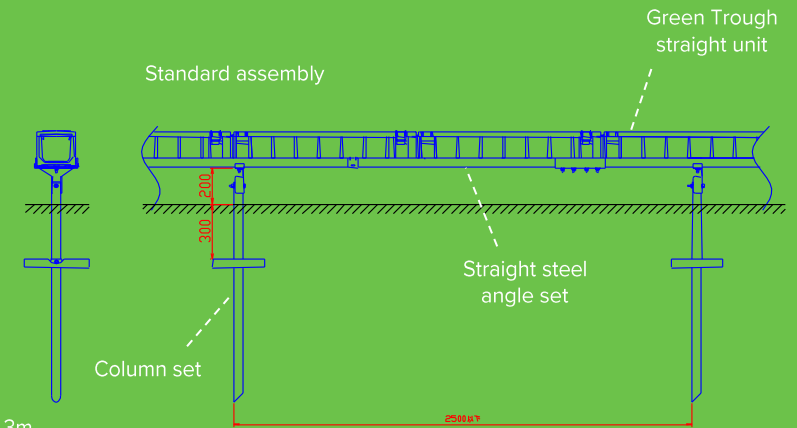


NOTE

90 and 135 straight units cannot be processed in this way and require manual modification on site.



ELEVATED SYSTEM



Column spacing:
90 and 135: Max 3m
200B: Max 2.5m
300B and 430C: Max 2m

Straight steel angle set



Column set



ELEVATED SYSTEM INSTALLATION METHOD



1 Dig hole and place the base plate at a depth of 300mm



2 Drive column into the base plate



3 Secure column to the base plate with included nut and bolt



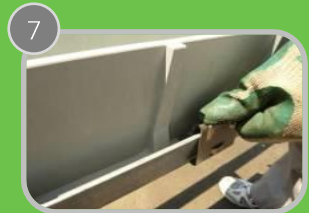
4 Backfill and attach the steel pedestal



5 Attach the steel tray to the pedestal using included fixture



6 Attach adjacent trays using the included connectors



7 Attach two fixing brackets to both sides of one steel tray.



8 Completed assembly

NOTE

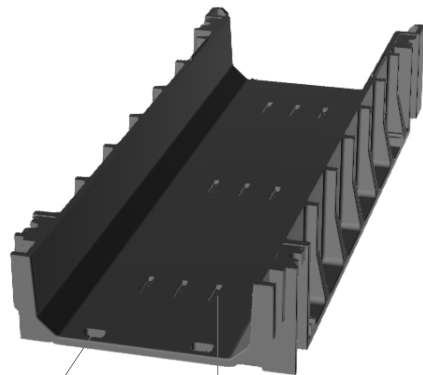
- Our steelwork elevated system is only for use with Green Trough.
- Ensure there are no obstacles buried at the construction site prior to installation.
- Do not apply excessive load to the elevated system, it is designed to hold Green Trough only.
- Ensure the column is driven securely and buried to a safe depth where it is stable.
- Take measures to prevent the bolts from loosening.
- Every fixing should be checked for tightness following assembly.



ANTI-SLIP WALKWAY GREEN TROUGH

A combined cable trough and hard-wearing safe walkway, developed in collaboration with our UK partner Trough-Tec Systems.

Green Trough walkway comprises of two units joined in parallel pairs to form a 780mm wide surface.
A15 according to EN 1433



Anti-theft cable tie securing locations

Built-in divider slots

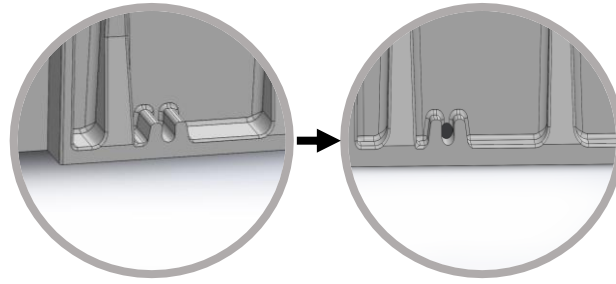
Part Name	Part No.	L (mm)	W	H	Internal Capacity
Walkway	TS300W	1045±10	780±8	215±10	72,000 mm ²



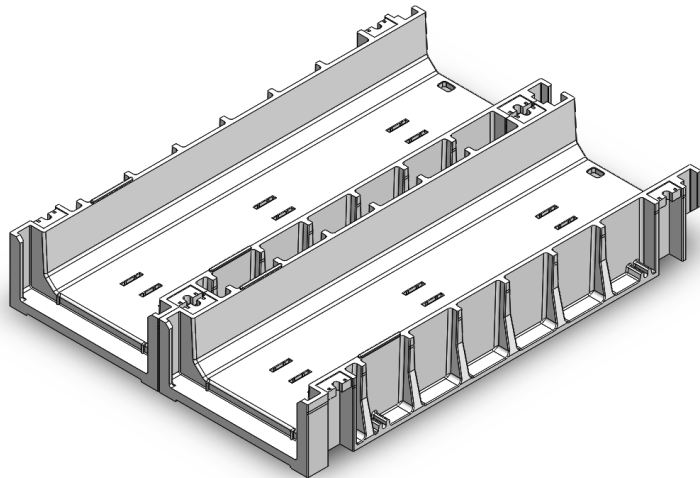
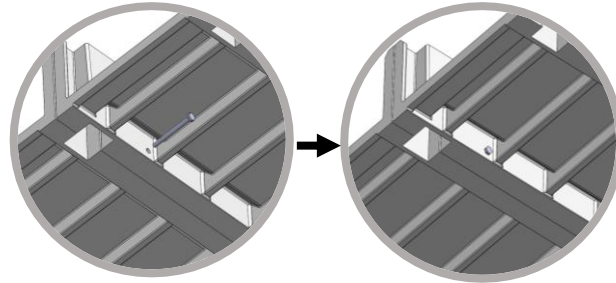
GREEN TROUGH
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- 1 Locate the two drill guide positions on the sidewall of the unit.

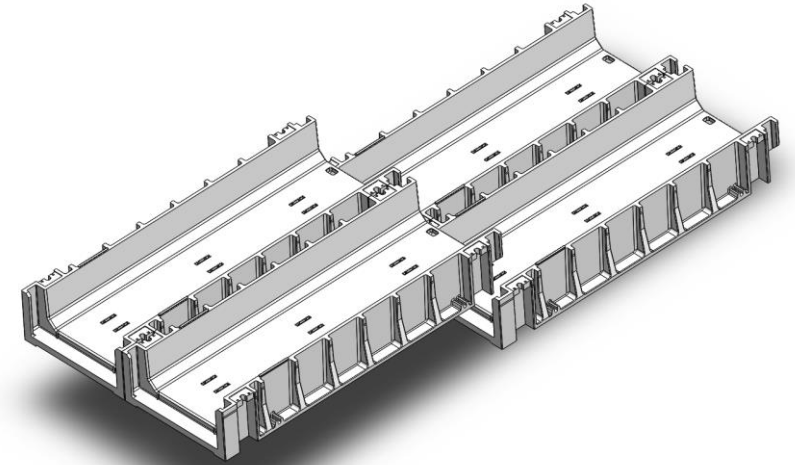
Using a 10mm drill bit, prepare the bolt holes and repeat the process on the adjacent unit.



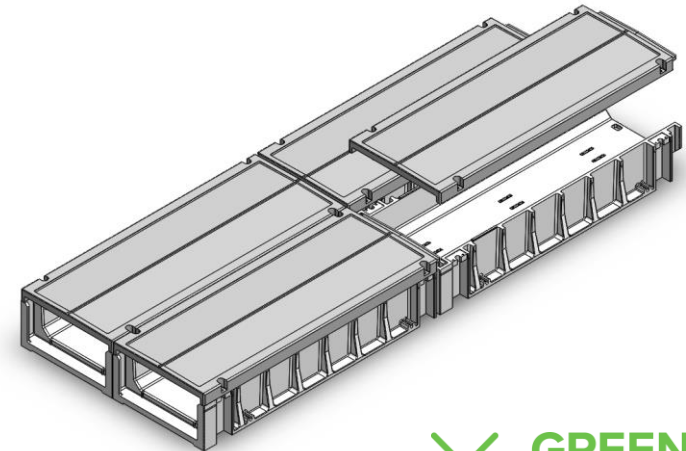
- 2 Align the two drilled sidewalls and secure together at both locations from the underside of the unit, using the included M8 x 100mm hex bolts and Nyloc nuts.



- 3 Repeat steps 1 and 2 on another metre section and connect the metre sections together using Green Trough's standard connection procedure, as illustrated below.



- 4 When necessary, install the lids with included screws.

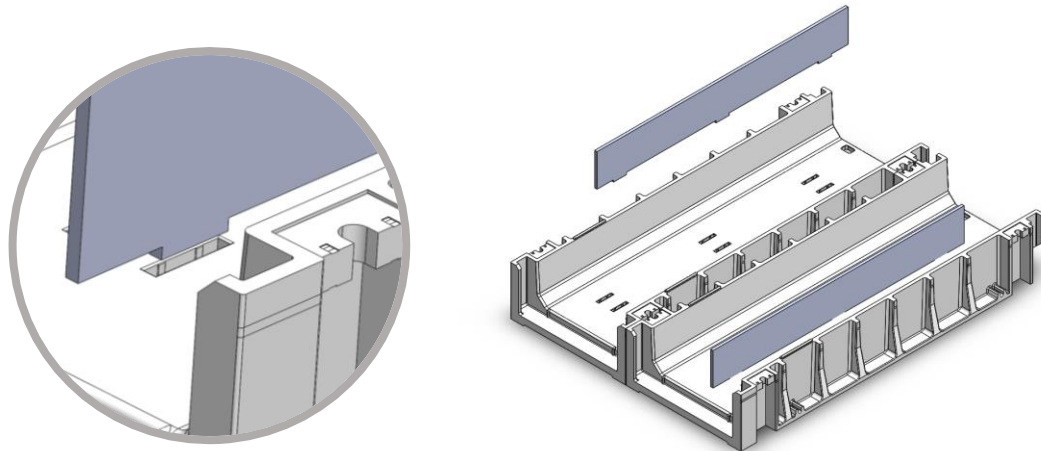


WALKWAY OPTIONAL ACCESSORIES

- Divider option
- Anti-theft solution

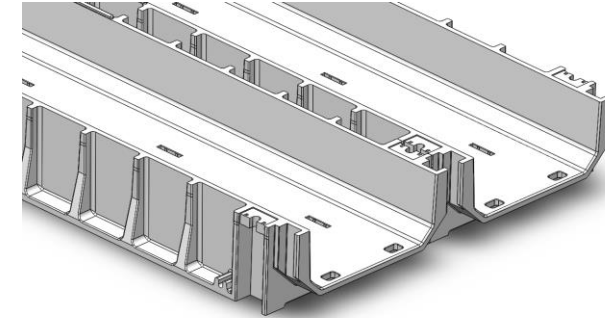
DIVIDER

Green Trough walkway has built-in slots for cable dividers as standard. The divider is simply inserted into the slots as below, and can be tapped into place with a rubber or plastic mallet/hammer. There are three possible divider positions.



ANTI-THEFT SOLUTION

As standard, each walkway unit has 2 slots in the male connector as pictured below:



A cable tie can be looped through the two holes and around installed cables to help prevent cable theft. The female connector covers the underside of the holes to prevent vegetation ingress, while allowing enough room for the cable tie.



