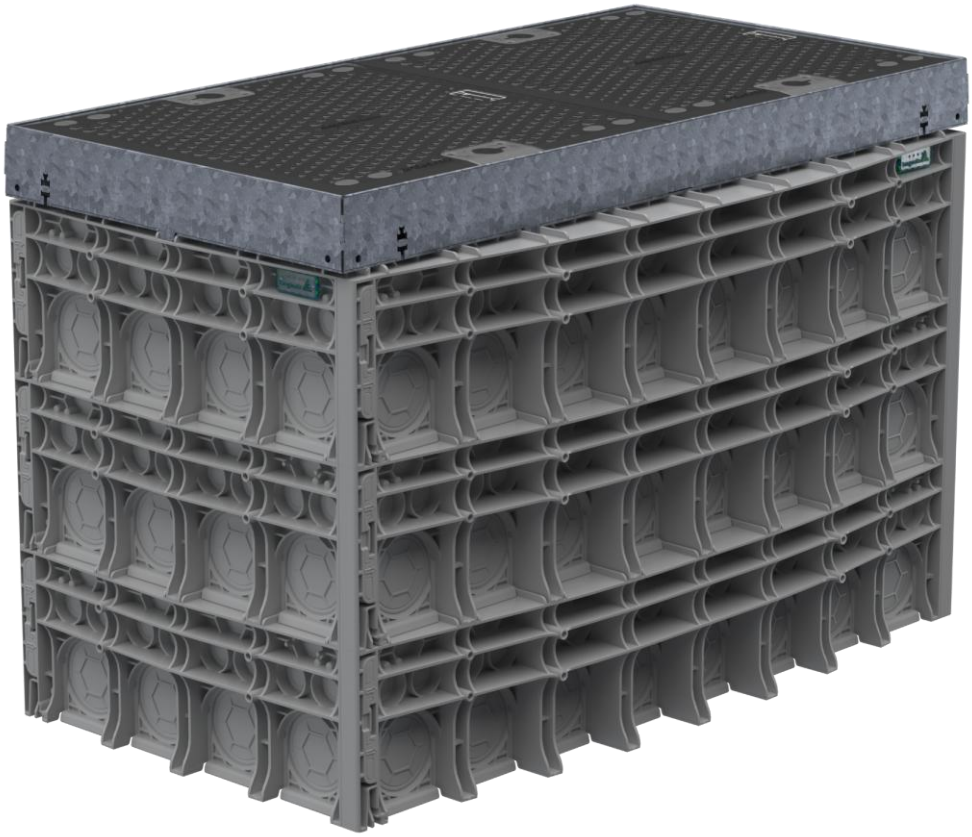
Langmatz

Installation Instructions

for “XeBo” polycarbonate manholes



XeBo

Contents

English

1 General information

These instructions are supplied with the equipment.

Caution!
Any person involved in installation, operation and repair of the product must first read, understand and follow these instructions. We accept no liability for damage and operating malfunctions caused by failure to comply with these instructions.

In the interest of further development, we reserve the right to change individual assemblies and accessories as considered necessary for enhanced safety and performance improvements, while preserving the main features.

2 Safety information

The “polycarbonate manhole” is designed for stationary use and use underground as a:

- Cable draw manhole,
- Telecommunication distribution point / fibre distribution point,
- Energy distribution system,
- System to accommodate electronic components.

Any manhole used for electronic components is not suitable for use in potentially explosive atmospheres.

The product complies with the state-of-the-art technology at the time of printing and is delivered in an operationally safe condition. Unauthorised modifications, particularly to safety-related parts, are prohibited.
Langmatz GmbH warns against the misuse of the product. Work on electrical or electronic fixtures may only be performed by qualified electricians / optical fibre specialists.

The operator is responsible for installation, operation and maintenance of the fixtures.

The operator is responsible for the following:

- Preventing danger to the life and limb of users and third parties.
- Ensuring operational safety.
- Preventing downtime and environmental impact caused by incorrect handling.
- Ensuring that protective clothing is worn when working with or on the product.

Use of a damaged product is prohibited. Please contact the hotline (see section 13).

Caution!

Comply with applicable occupational safety and environmental protection regulations during installation, operation, maintenance, and repair.

2.1 Warning symbols used

Prohibition or mandatory action symbol.

Beware of the risk of injury.

Beware of the risk of crushing.

3 Product description

The manhole is made of frame parts constructed in a modular manner, which snap together and lock securely with each other thanks to their integral snap-in locking system. This snap-in locking system ensures that the individual frame levels are connected solidly to each other, at the same time enabling the manhole to be disassembled simply. This feature enables subsequent work, such as cut-outs or on-site adjustments, to be done with ease.
The individual frame elements can be rotated, so that predetermined breaking points can be moved into the specific position required. In turn, this enables the manhole to be adapted flexibly to different situations on site and cable routing requirements.
Manholes may be constructed from a maximum of **four frame levels.**
As Langmatz polycarbonate manholes come in a wide variety of sizes and versions, these instructions are based on one product, by way of example: the “XeBo” manhole with clear dimensions (CD) 600 x 1200 mm / 860 mm high.

Technical Assessment (ETA 26/0223) based on a European Assessment Document (EAD), confirmed by the European Organisation for Technical Assessment (EOTA).

3.1 Dimensions

(Product example CD 600 x 1200 mm)

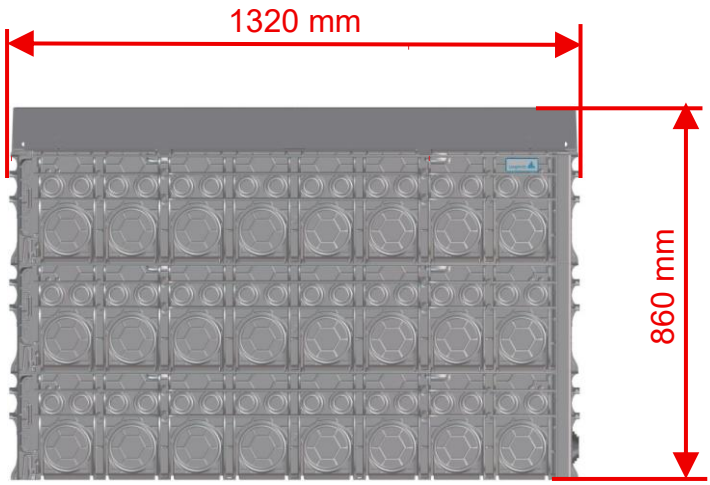


Fig. 1

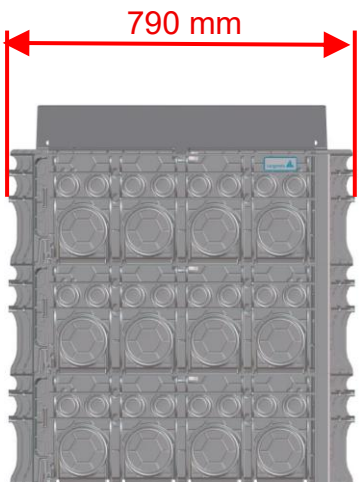


Fig. 2

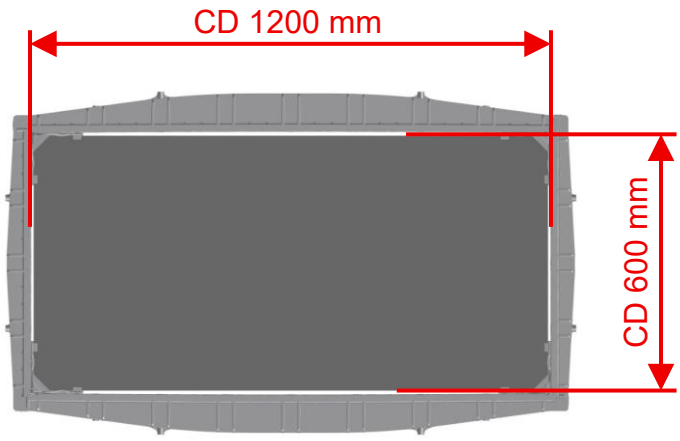


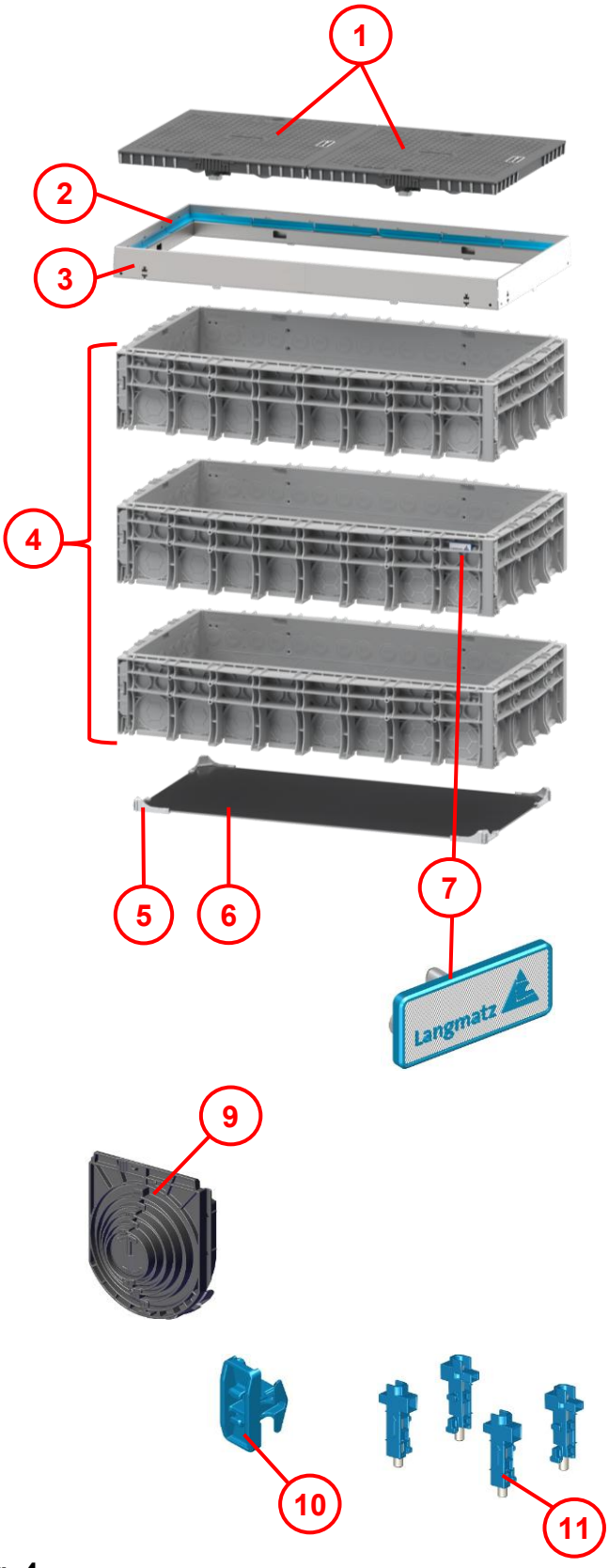
Fig. 3

3.2 Technical data

External dimensions L x W x H:	1320 x 790 x 860 mm
Internal dimensions L x W x H	1200 x 600 x 750 mm
Total weight	approx. 152 kg
Frame element material:	polycarbonate (PC)
Steel frame material:	hot-dip galvanised steel
Manhole cover versions:	cast steel: C250 swivelling cast steel: C250 hot-dip galvanised, concrete-lined steel: C250
Manhole closure versions:	90° locking mechanism

4 Scope of delivery

(Product example, CD 600 x 1200 mm / 860 mm high)



Item 1 2x cast-iron covers

Item 2 Damping pad

Item 3 1x steel frame

Item 4 Frame levels
(1-4 possible, depending on scope of order)

Item 5 4x corner adapters
(depending on scope of order)

Item 6 Base plate
(depending on scope of order)

Item 7 2x disassembly tools / logo

Optional accessories

Item 9 Universal hole plug Ø110 mm

Item10 Universal connector (number depends on the design)

Item11 4x height adjustments

Fig. 4

4.1 Required tools (not included)

1 Key with lifting hook
(Type depends on locking mechanism design. Available to order from Langmatz).

2 Hammer

Optional (not shown):

- Slot screwdriver
- AF 5 hexagon screwdriver
- Jig saw

Fig. 5

The following tools are needed to open the cover depending on the locking mechanism of the manhole cover:

Hex head	Hex socket head	LIC-LOCK	COLT / TELENET / OTC
AF 24	AF 14	Special tool	

5 Foundation pit base

5.1 General

The manhole must be installed by a specialist company.
Assess the ground conditions before preparing a load-bearing foundation pit base.

- The highest groundwater level must be at least 1,200 mm below ground level for manholes with an overall height of less than 680 mm.
- The manhole must be installed in “non-cohesive” to “cohesive” mixed soils.
- Group G1 to G3 soil types as per ATV-DVWK-A (German Association for Water, Waste Water and Waste) 127, and/or soil groups GE, GW, GI, SE, SW, SI, GU, GT, SU, ST, GU*, GT*, SU*,ST*, UL and UM as per DIN 18196.

Attention!

Installation is only permitted in areas up to load class C250 in accordance with DIN EN 124:

- **Group 1 (minimum class A15): Strictly designed for areas restricted to use by pedestrians and cyclists.**
- **Group 2 (minimum class B125): Pedestrianised zones and comparable zones,car parks or car parking decks.**
- **Group 3 (minimum class C250): For applications in kerbside channels of roads, which project at most 0.5 m into the carriageway and at most 0.2 m into the pedestrian zone, measured from the face of the kerb.**

Observe ZTV A-StB 12 (Supplementary Technical Contract Conditions and Guidelines for the Construction of Asphalt Roads) for the construction of the road surface!

5.2 Preparing the foundation pit base

When preparing the foundation pit, comply with the following documentation from the Gütegemeinschaft Leitungstiefbau e.V. (Underground Cable Line Construction Quality Association):

“Procedural instructions for working in underground cable line construction”.

Ensure that the position and depth of the foundation pit base matches the installation situation.
The upper edge of the manhole cover must lie completely flush with the surrounding ground level and must not protrude.

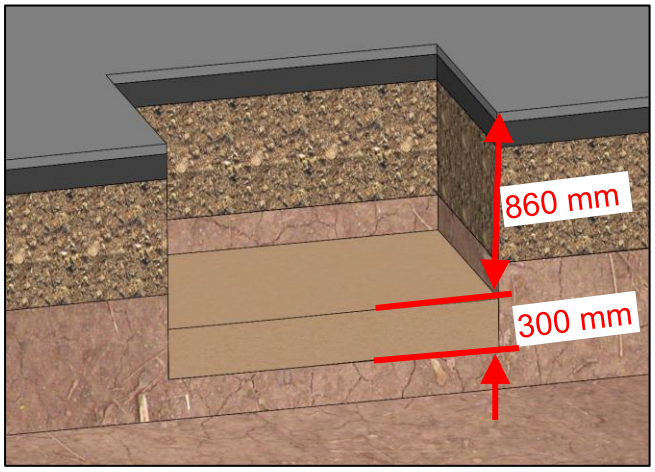


Fig. 6

- For group G1 soil types, use an underfill as per ATV-DVWK-A 127. Minimum thickness 300 mm. The underfill must be layered and compacted to DPr ≥ 97%.

6 Manhole installation

6.1 Constructing the base

Installation of the “complete manhole” (see 6.1.1) and installation of a “manhole consisting of individual parts” (see 6.1.4) are described below. Go to the relevant section depending on the scope of your delivery.

6.1.1 Installing the complete manhole

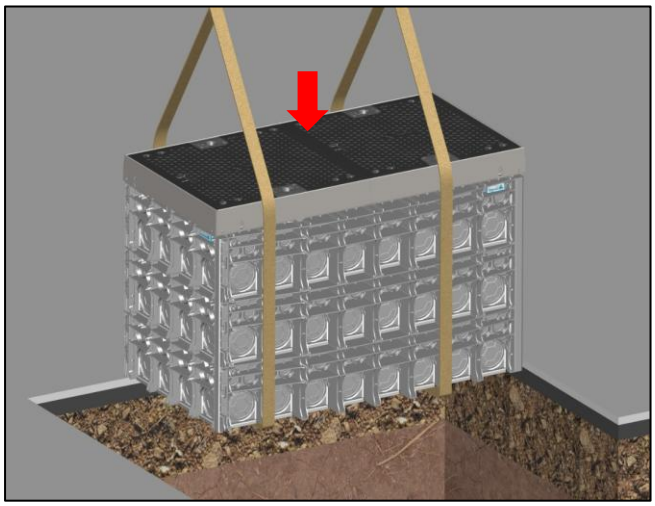


Fig. 7

- Place the complete manhole on the foundation pit base, or construct the individual parts of the manhole body depending on how it is supplied.

Warning:

- When inserting the manhole, place slings or similar around the entire manhole.
- If the manhole tips or drops, it may cause injury.
- Where manholes are factory-fitted with transport hooks, they must be used.

Caution!

Risk of becoming caught.

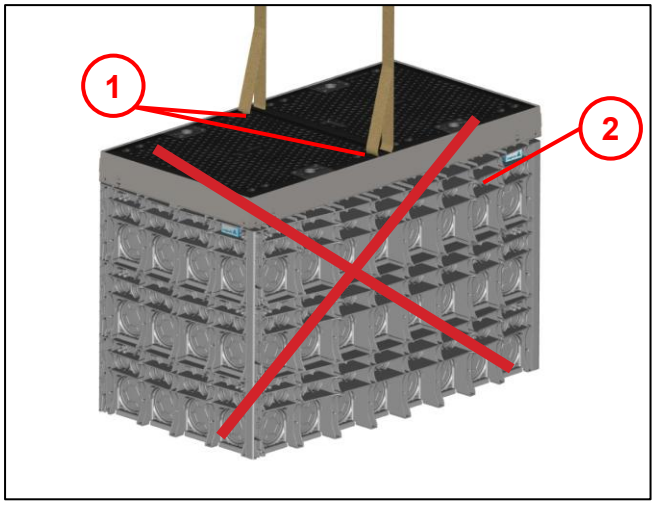


Fig. 8

Warning:

- Do not use the lifting openings in the manhole cover **(1)** to lift the manhole itself.
- The manhole cover (e.g. cast) could rip out, damaging the steel frame **(2)**.

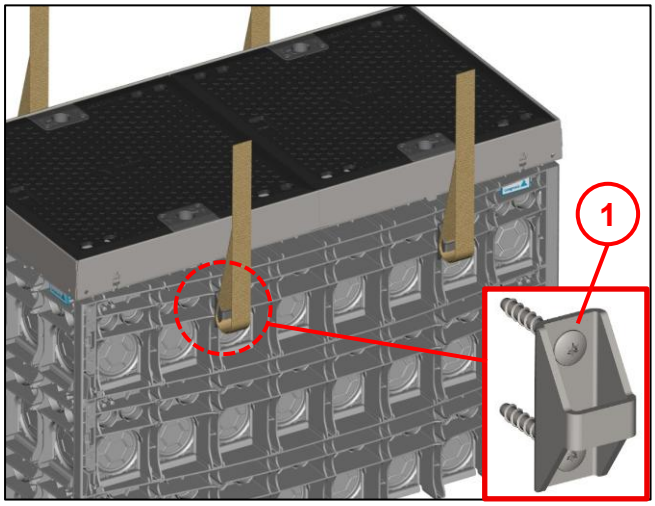


Fig. 9

Lifting the manhole using transport lugs.

- 4x transport lugs **(1)** are fitted with 2x TX 10 x 60 screws to the outside of the long sides of the manhole.

Warning:
The use of transport lugs is only permitted for a maximum frame height of four elements including cover or maximum weight of 500 kg.

6.1.2 Opening the manhole cover (standard cover)

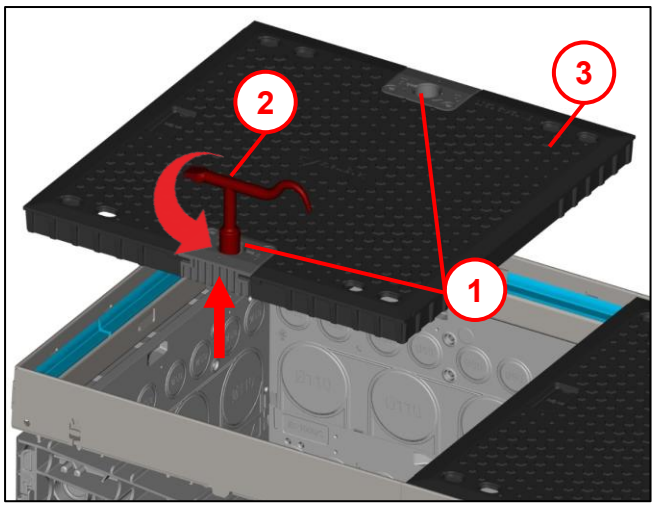


Fig. 10

- Use the appropriate key **(2)** to open the manhole cover **(3)**, turning the 2x lock catches **(1)** per cover to the “OPEN” position (90° anticlockwise).
- Using a suitable tool, lift the manhole cover and pull it out sideways.

Note!
A version with swivel cover is available to order.

6.1.3 Opening the manhole cover (swivel cover)

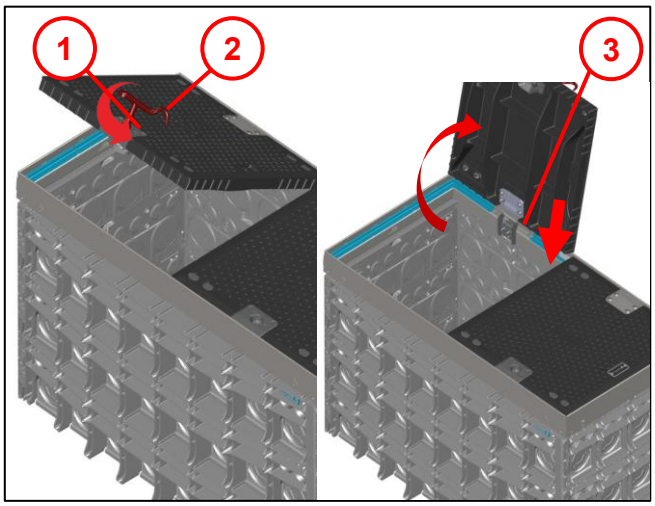


Fig. 11

- Use the appropriate key **(2)** to open the manhole cover, turning the 1x lock catch **(1)** per cover to the “OPEN” position. (90° anticlockwise)
- Fully open up the cover and allow it to snap downwards into the safety mechanism **(3).**

6.1.4 Installing the manhole with individual parts

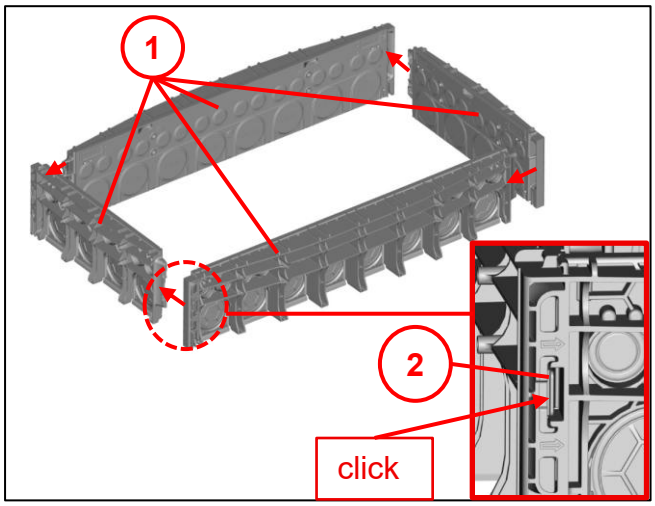


Fig. 12

- Snap the frame elements **(1)** together until the respective snap lugs **(2)** engage.

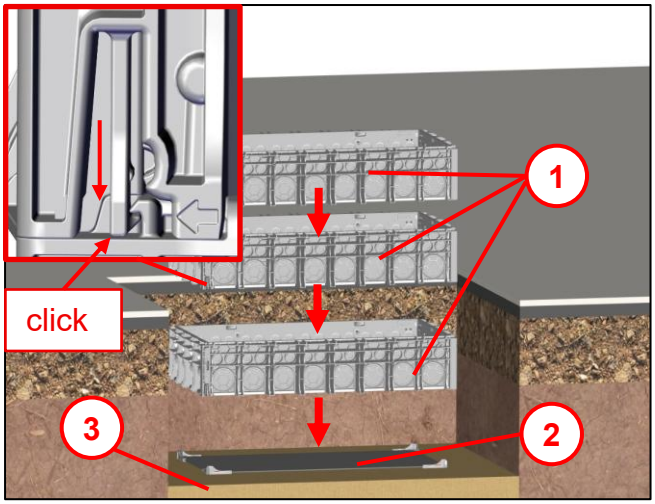


Fig. 13

- Place the base plate **(2)** on the foundation pit base **(3)**.
- Place the frame level **(1)** onto the base plate.
- Position the frame levels.
  (Number depends on the design)

Note!

- Snap the frame elements into the locking mechanism.
- All frame elements can be installed upside down. (see Fig. 14)

Caution!
Risk of becoming caught.

6.1.5 Installation of the frame level upside down

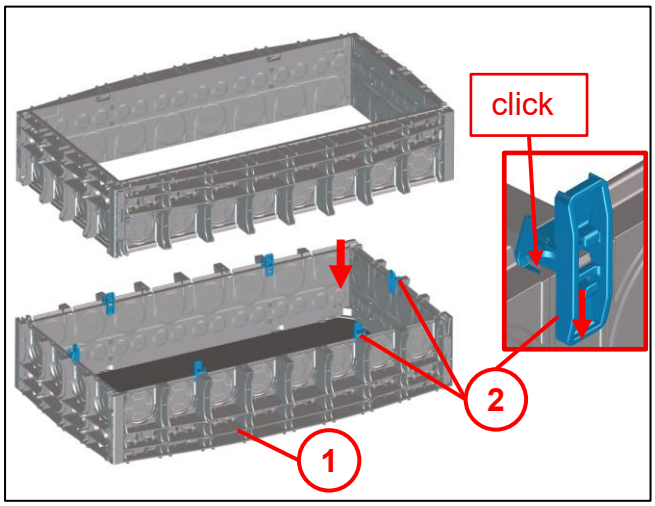


Fig. 14

- The lower frame level **(1)** can be installed upside down to vary the position of the predetermined breaking points.
  Note!
  The uppermost level cannot be rotated as it accommodates the cover.
  (possible with manholes with 2-4 levels)
- Attach universal connectors **(2)** when installing the frame upside down.
- For position and number see (Fig. 15 and Fig. 16)

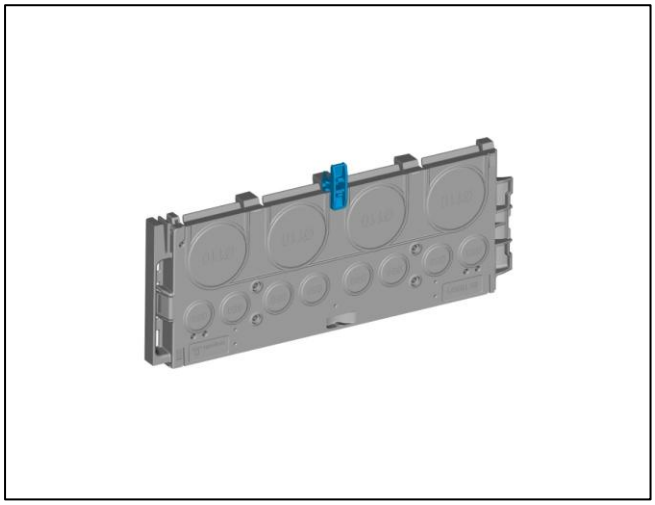


Fig. 15

Connector positions for 600 mm frame parts

1x connector, central.

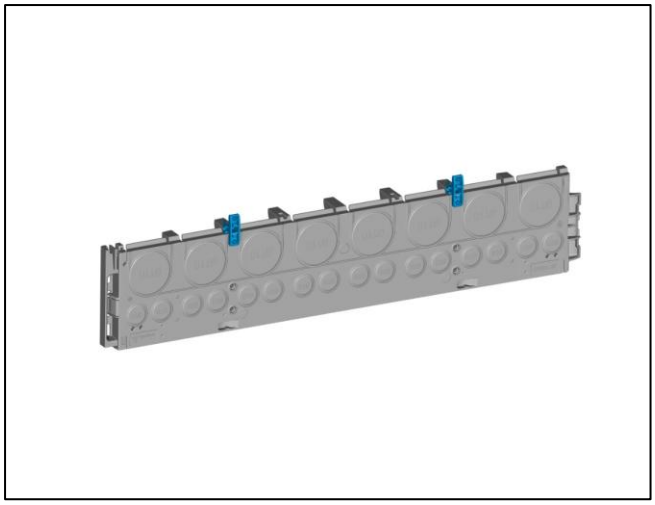


Fig. 16

Connector positions for 1200 mm frame parts

2x connectors, each one located at the second bar from the outside.

6.1.6 Disassembly of the manhole with individual parts

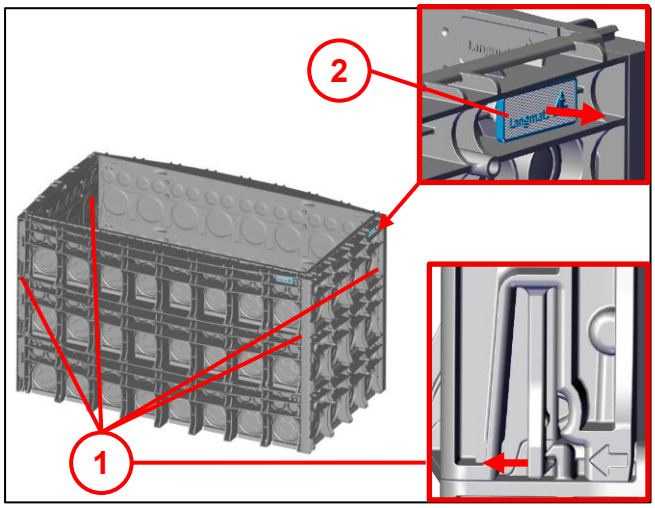


Fig. 17

- To change the manhole construction, use the disassembly tool **(2)** to unlock 4x snap tabs **(1)** and then remove the frame element.

Note!
The disassembly tool / logo **(2)** is attached to the frame element and can be removed.

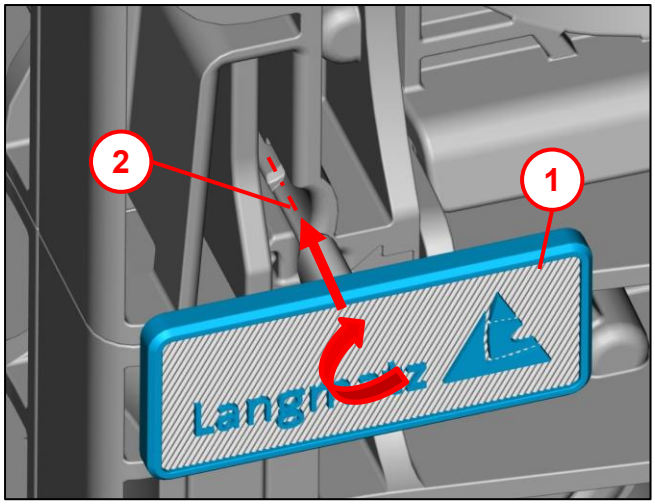


Fig. 18

- Insert the disassembly tool / logo **(1)** into the opening **(2)** (horizontally) and turn clockwise (vertically).
- Press the disassembly tool **(1)** in vertically to unlock.
- Leave the disassembly tool inserted.

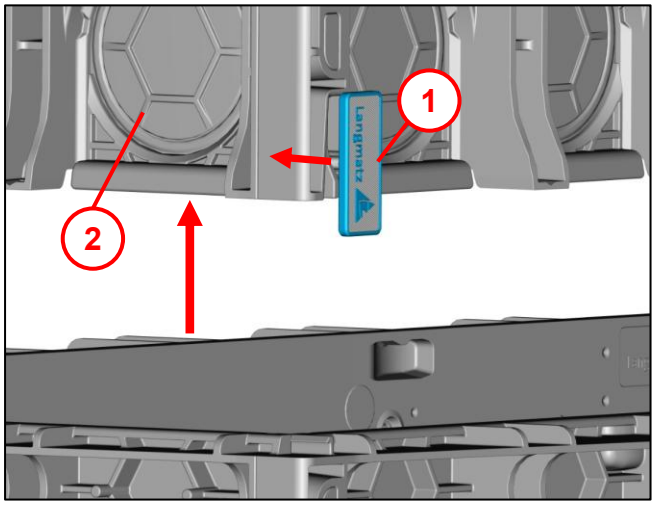


Fig. 19

- Leave the disassembly tool inserted (vertically) and repeat the process with the other snap tabs.
- Lift off the frame **(2).**

Note!
We recommend unlocking two snap lugs using the disassembly tool, and unlocking the other two snap lugs by hand to lift off the frame.

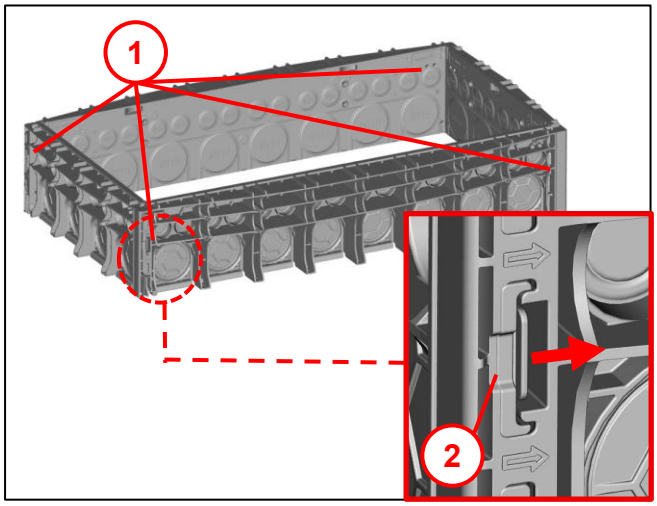


Fig. 20

The frame levels can also be disassembled into individual parts.

- Simply unlock the snap lugs **(2)** by hand at the 4x corners **(1).**

Note!
No tool is needed to disassemble the frame levels.
(A slot screwdriver can be used).

6.1.7 Installing the steel frame

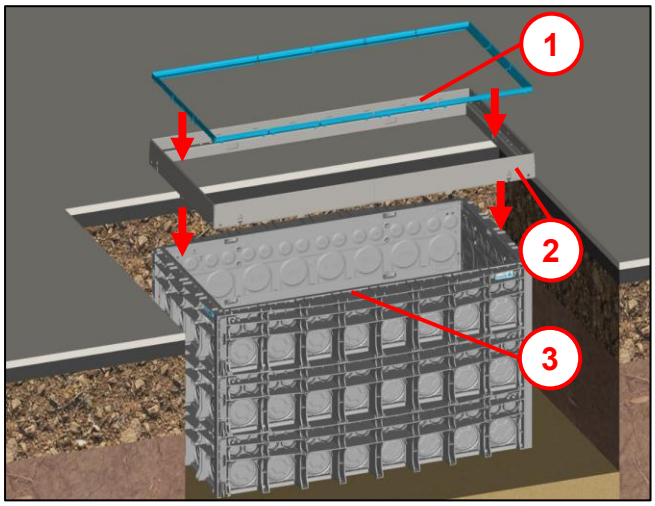


Fig. 21

- Place the steel frame **(2)** with damping pad **(1)** onto the upper frame level **(3)**.

Caution!
Risk of becoming caught.

6.1.8 (Optional) frame anchors to connect steel frames to polycarbonate frames

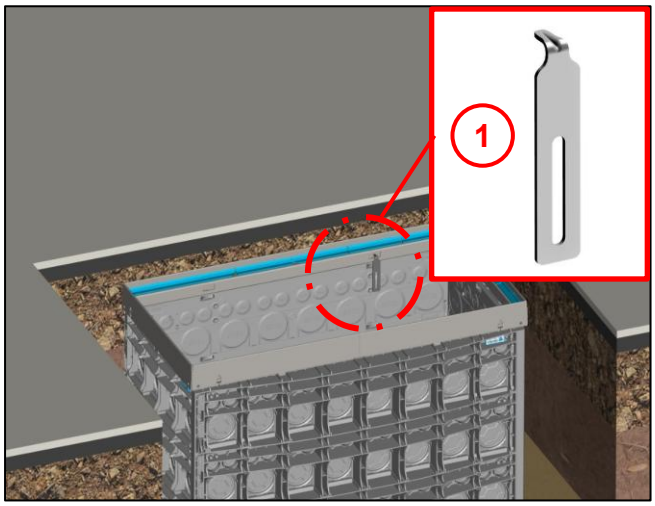


Fig. 22

A frame anchor can optionally be installed to connect the steel frame to the plastic frame.
(Not included with standard delivery. Please order separately).

Note!
The use of frame anchors is recommended with swivel covers or with top layers that are not made of concrete or asphalt (e.g. field or loose base surface) in order to avoid the steel frame from being levered out.

- Install the frame anchor **(1)** in accordance with the installation instructions provided.

6.2 Manhole structure for new routes

6.2.1 Removing the predetermined breaking point for Ø110 mm / Ø50 mm cable ducts

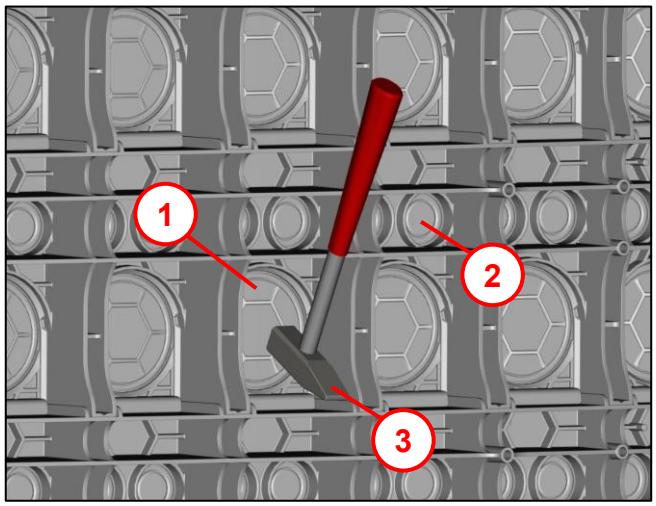


Fig. 23

- Determine the required number of cable ducts and their position.
- Use a hammer **(3)** to knock out the relevant Ø110 mm **(1)** or Ø50 mm **(2)** predetermined breaking points from outside.

Caution:
Sharp swarf or burrs can be produced when separating the predetermined breaking points - **wear appropriate protective clothing.**

- Use a suitable tool to remove any swarf or burrs produced.

6.2.2 Installing the stepped grommets / protective pipe seals

(Example is shown with cables and conduits)

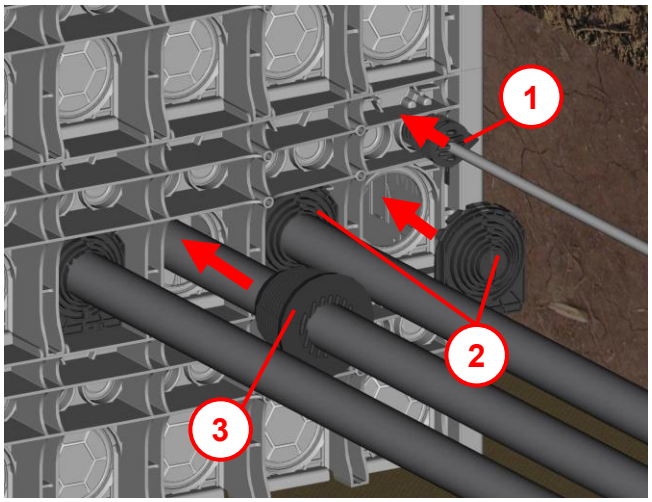


Fig. 24

We recommend the use of a protective pipe seal Ø110 mm **(3)**, protective pipe seal Ø50 **(1)** or universal hole plug **(2)** to prevent the manhole from silting up when laying grounding cables and pipes with a defined diameter.

Note!
Not included with standard delivery. Please order separately.

- Using a suitable tool, open up the required pipe diameter at the predetermined breaking point. (See Fig. 25)
- Insert the protective pipe seal or universal hole plug from outside into the opening in the manhole as shown (noting the direction of installation!)

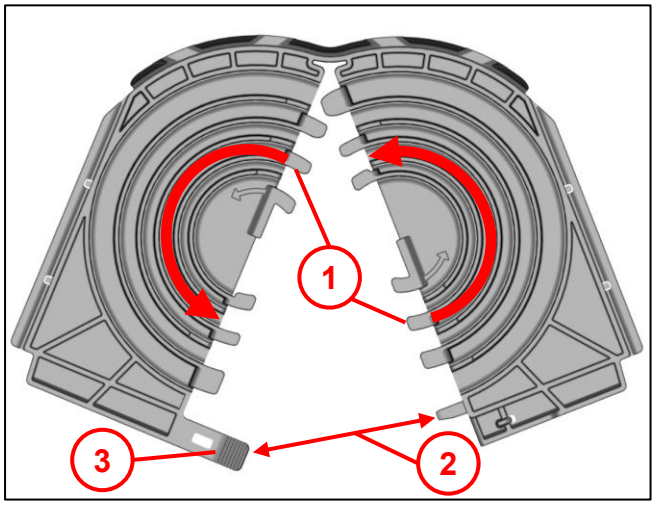


Fig. 25

Create the diameter required before installing the universal hole plug.

- Pull the lug **(1)** along the radius and tear off.
- Close the halves **(2)** and snap in the lug **(3).**

6.2.3 Installing micro-duct pipes
(Illustrative example)

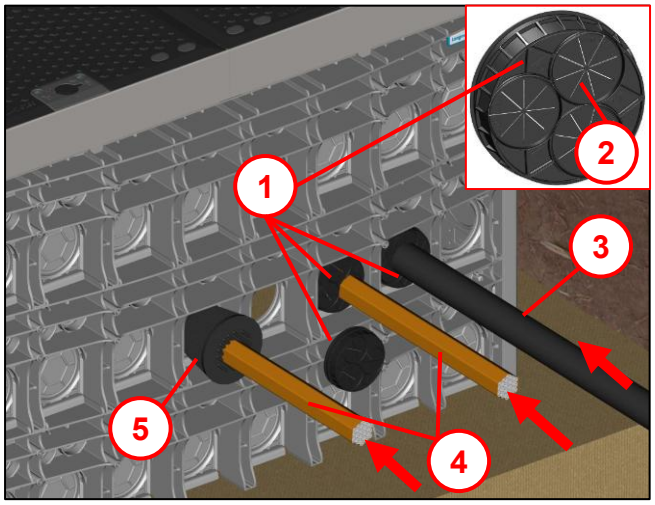


Fig. 26

The micro-duct pipe adapter **(1)** and protective pipe seal **(5)** do not form part of the standard delivery and must be ordered separately.

- Insert the micro-duct pipe adapter from outside into the open cable duct until the circumferential groove clicks into the opening over the circumferential edge (note the direction of installation!).
- Guide the micro-duct pipe bundle **(4)** (max. Ø 46 mm) into the manhole either through the slotted openings **(2)** in the micro-duct pipe adapter or protect it with a protective pipe seal **(5)** to prevent it from silting up.
- With pipes with max. Ø 50 mm **(3)**, grip the slotted openings **(2)** of the micro-duct pipe adapter at the marked lug ↻ and remove.

6.3 Manhole construction for existing routes

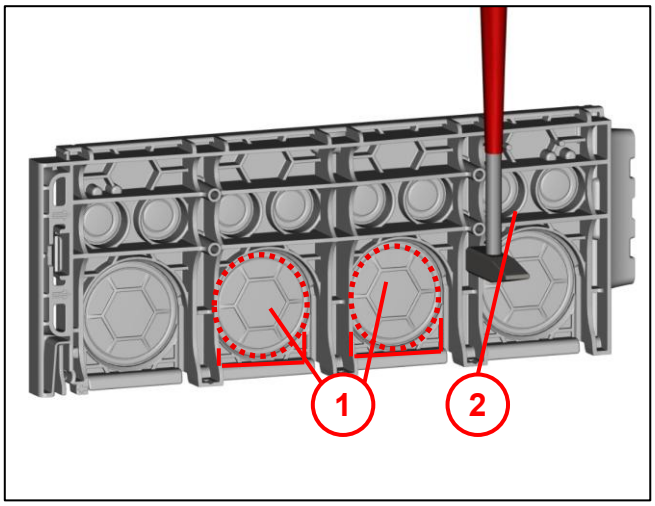


Fig. 27

Prepare the frame level for building over.

- Knock out the required predetermined breaking points **(1)** on the frame elements **(2).**

Caution:
Sharp swarf and burrs can be produced when separating the predetermined breaking points. **Wear appropriate protective clothing.**

- Use a suitable tool to remove any swarf or burrs produced.

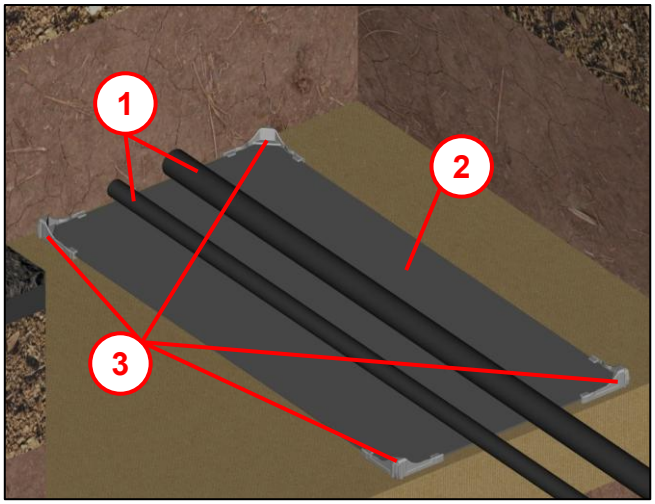


Fig. 28

- Install the base plate **(2)** with corner connectors **(3)** below the existing route **(1).**

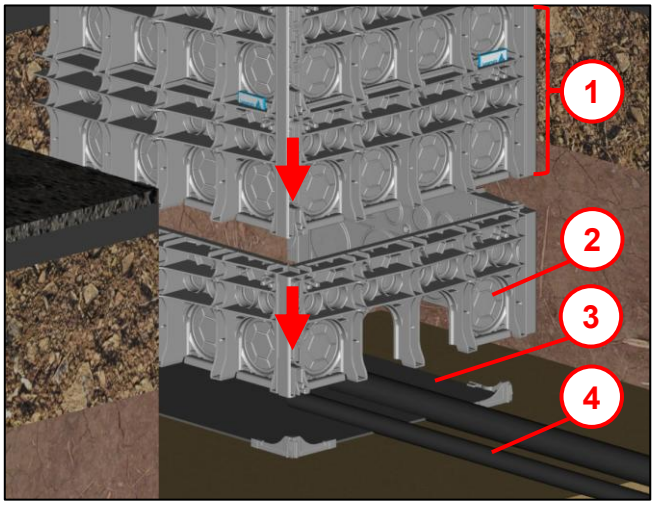


Fig. 29

- Place the frame level that can be built over **(2)** above the route **(4)** on the base plate **(3).**
- Construct the manhole with the remaining frame elements **(1)**. (See Fig. 13)

Caution!
Risk of becoming caught.

6.4 Backfilling the foundation pit up to the lower edge of the top layer

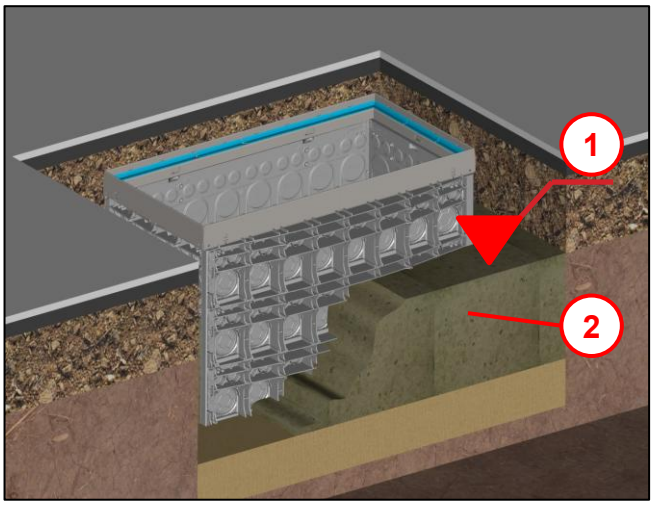


Fig. 30

Backfill the foundation pit in layers using material suitable for compacting **(2)** in accordance with ZTV E-StB 09 up to the lower edge of the top layer **(1)**.

6.5 Closing the manhole cover

6.5.1 Standard cover

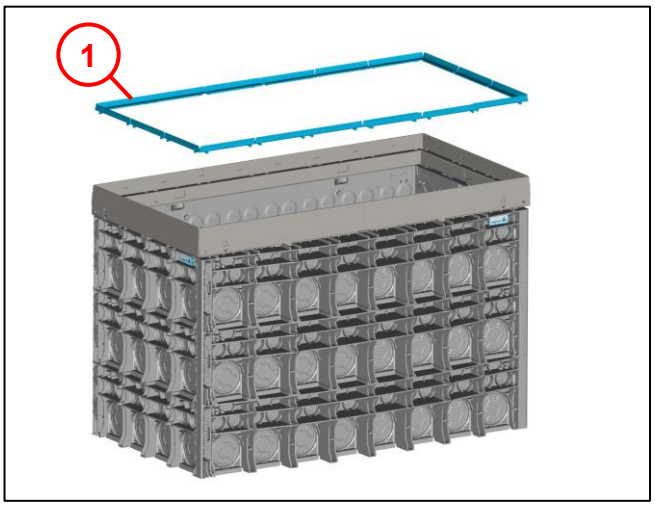


Fig. 31

The following must be observed to ensure proper assembly of any manhole cover:

- The damping pad (1) must be completely intact.
- The damping pad may not be damaged.
- The damping pad must be cleaned before the manhole cover is inserted to ensure that the manhole cover fits as well as possible.

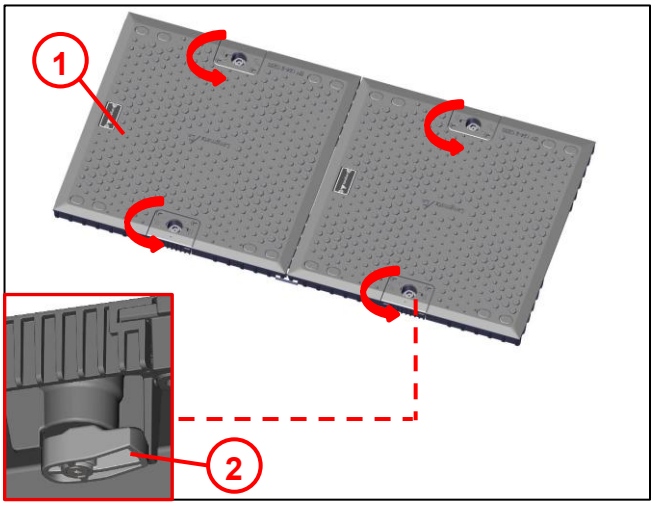


Fig. 32

- Before inserting the manhole cover **(1)**, turn the lock catch **(2)** to the “OPEN” position (90° anticlockwise).

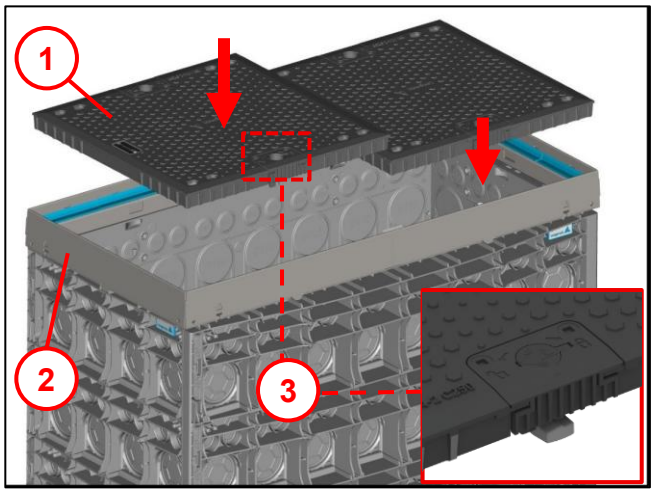


Fig. 33

- Using a suitable lifting tool, lift the manhole cover **(1)** and place it on the steel frame **(2)**.

Note!

- With multi-section manhole covers, ensure that the locking mechanisms are always on the long side **(3)**.

Caution!
Risk of becoming caught.

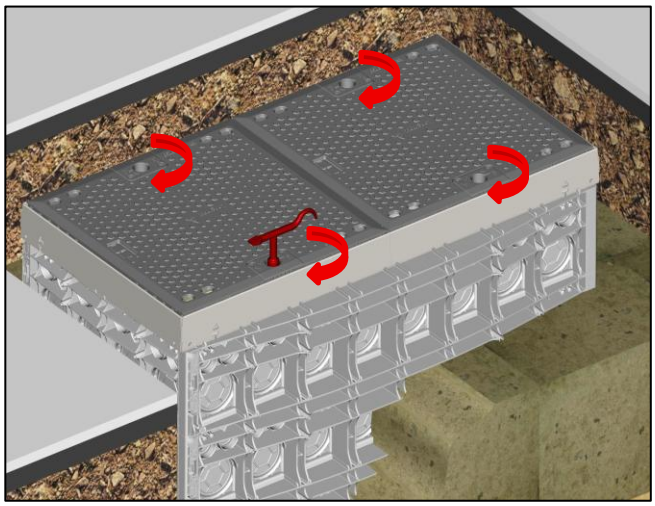


Fig. 34

- To lock the manhole cover, turn the lock catch to the “CLOSED” position (90° clockwise).
- The cover is locked in place when it audibly snaps into place.

6.5.2 Closing the swivel cover

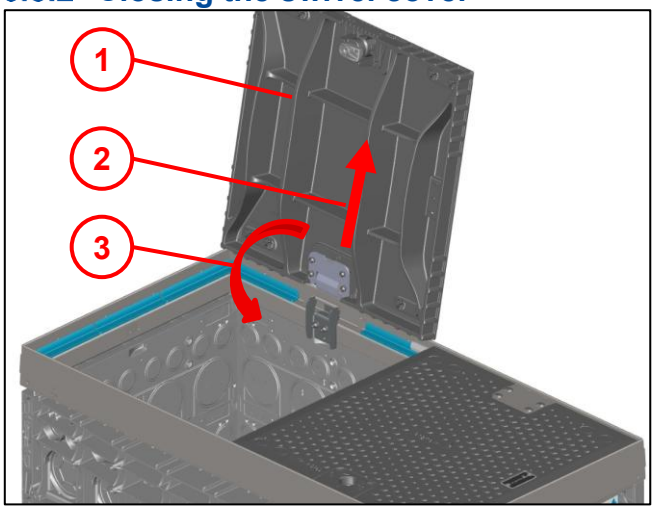


Fig. 35

- Lift the cover **(1)** up and out **(2)** of the safety mechanism.
- Swivel the cover closed **(3)**.

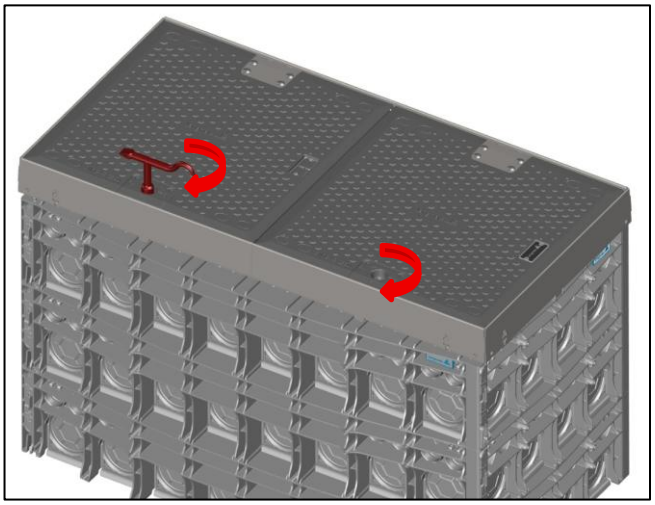


Fig. 36

- To lock the manhole cover, turn the lock catch to the “CLOSED” position (90° clockwise).
- The cover is locked in place when it audibly snaps into place.

6.6 Constructing the top layer

(Example shows vehicle traffic areas)

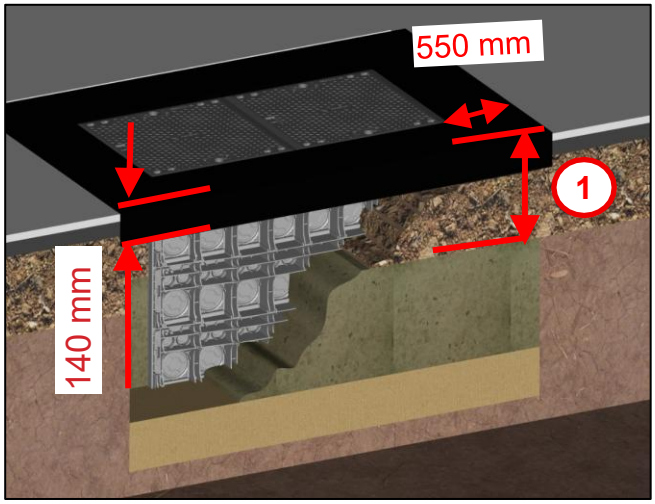


Fig. 37

- Construct the top layer **(1)** in accordance with ZTV A-StB 12 (and/or Guidelines for the standardisation of traffic area top layers RStO 2012).
- When creating the top layer in vehicle traffic areas, allow a strip of concrete or poured asphalt at least 550 mm wide and 140 mm thick (asphalt base layer of at least load class 0.3 according to RStO 2012).

Manhole installation without height adjustment is completed.

7 Optional: manhole installation with height adjustment

7.1 Using dry mortar

(similar to Kombina 35 S)

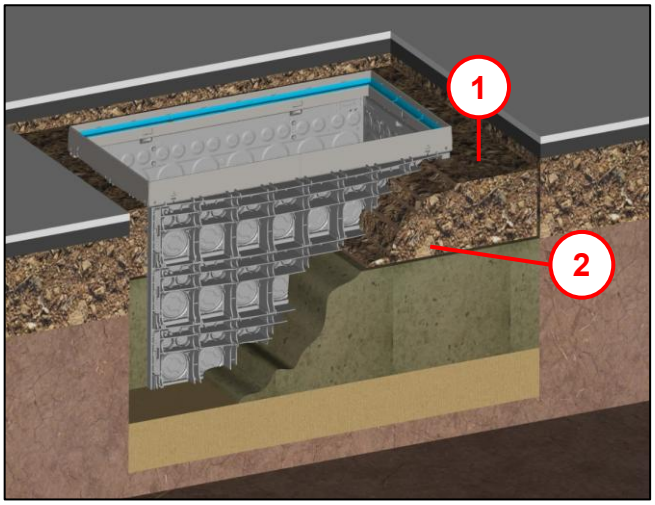


Fig. 38

- Backfill the foundation pit in layers using material suitable for compacting **(2)** in accordance with ZTV A-StB 12 (and/or ZTV E-StB 09) up to the **lower edge of the top layer (1)**.

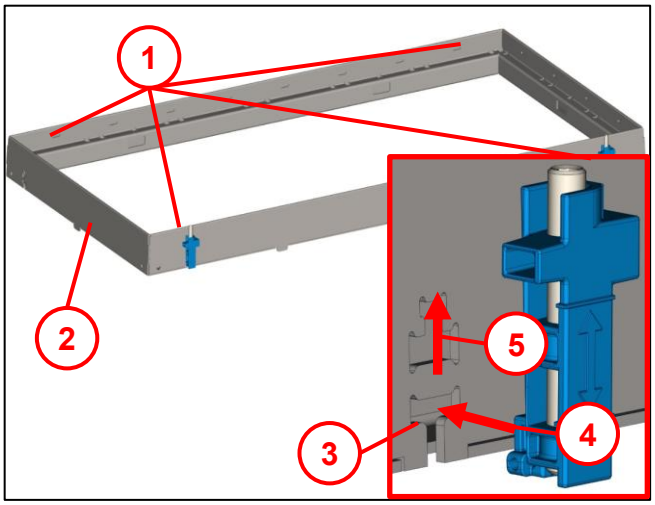


Fig. 39

- Fit 4x height adjustments **(1)** to the long sides of the steel frame **(2).**
- Insert **(4)** the height adjustment into the opening **(3)** and snap in upwards **(5).**

Note!
Carefully tap with a hammer if the height adjustment cannot be fitted by hand.

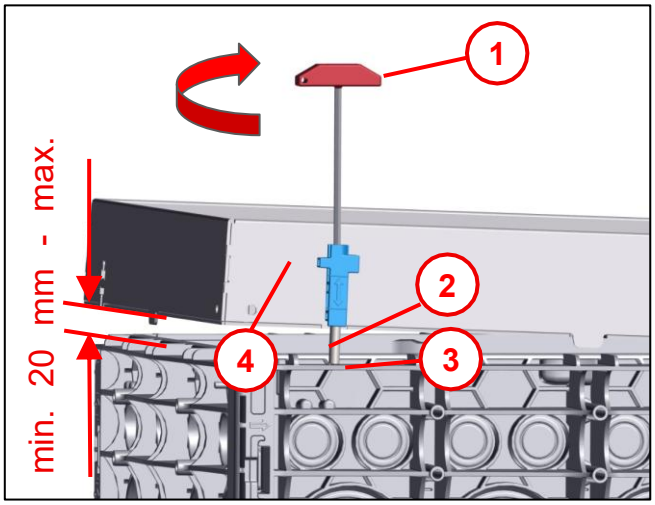


Fig. 40

- Place the steel frame **(4)** onto the upper frame level.
- Turn the AF5 hex screwdriver **(1)** clockwise at all four height adjustment points to lift the steel frame **(4)** and adjust it to the intended manhole cover height.

Note!

- The ideal adjustment range is minimum 20 mm to maximum 50 mm.
- Ensure that the set screw **(2)** is always in contact with the frame surface **(3)**.

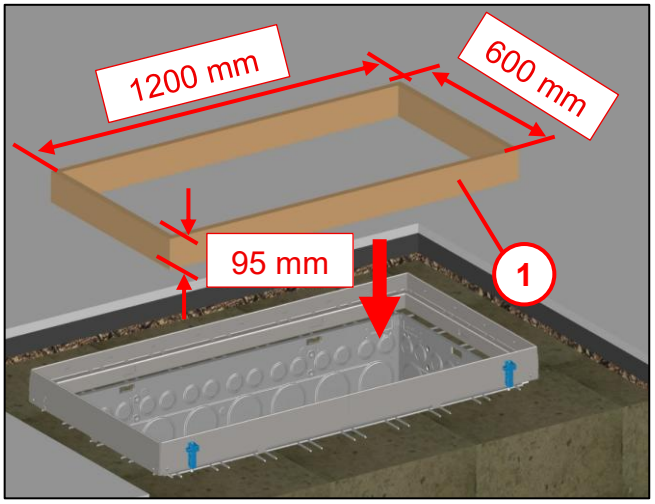


Fig. 41

Note!

Pay attention to the information provided by the manufacturer of the dry mortar.

Note!

Before using the dry mortar, create a formwork frame to prevent the dry mortar from penetrating into the manhole.
External dimensions: CD x CD x 95 mm

Illustrated by: 1200 x 600 x 95 mm

- Insert the formwork frame **(1).**

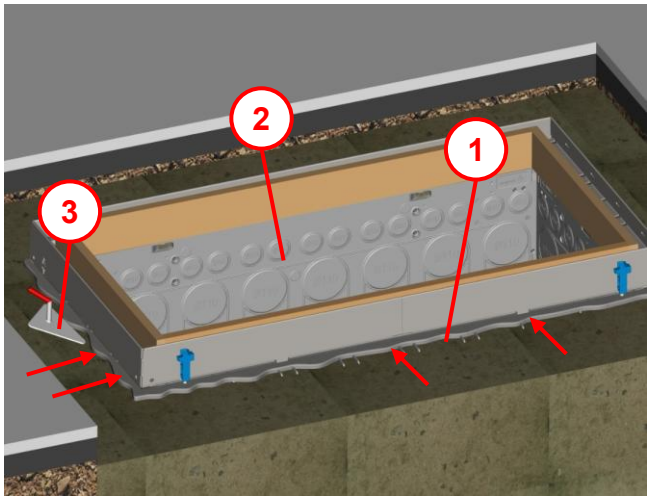


Fig. 42

- Use dimensionally stable dry mortar **(1)** to fill in the gap between the upper frame and the steel frame.

Note!
Use a trowel **(3)** to backfill dry mortar from outside under the steel frame.

- Inside, the formwork frame created **(2)** prevents dry mortar from penetrating.
- Backfill according to DIN 18555
- Compressive strength >35 N/mm² after 28 days.

Note!
Do not use foam or gravel to fill in the gap! It does not meet load capacity requirements!

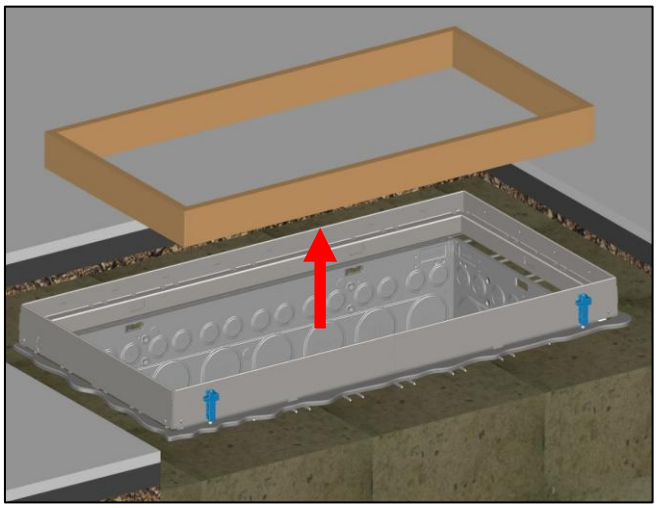


Fig. 43

- Remove the formwork frame once the dry mortar has cured.

Note!
Note the instructions issued by the manufacturer of the dry mortar.

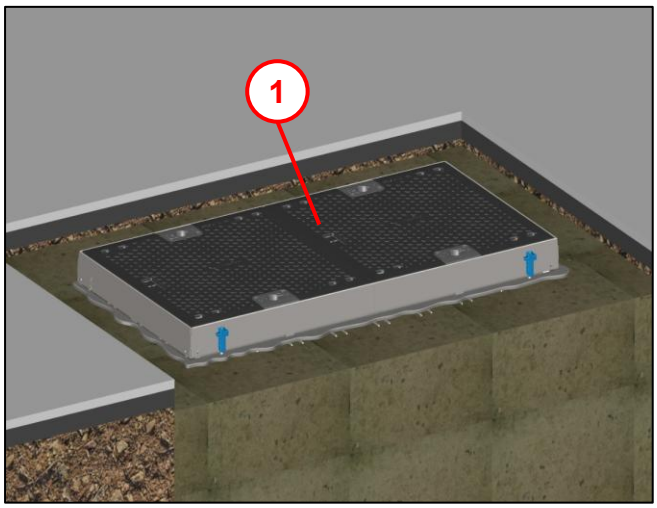


Fig. 44

- Replace and lock the manhole cover **(1)**. (See section 6.5)

Note!
Only load the manhole once the dry mortar used has reached the rigidity specified by the manufacturer!

- Construct the top layer in accordance with ZTV A-StB 12 (see section 6.6).

8 Recommended maintenance

Measures	Intervals	Remarks
Check, clean and replace any missing hole plugs before opening the manhole cover and locking mechanism.	With each use.	Only open and close the locking mechanism with the operating key supplied for this purpose. Use appropriate lifting equipment to lift off the cover.
Check the damping pad for the manhole cover.	Vehicle traffic areas: Once per year Pedestrian areas: As required	Replace if damaged.
Clean the damping pad for the manhole cover.	With each use.	Sweep clean with a brush.

9 Material defects

Langmatz GmbH accepts liability for material defects in the product as per Section 434 BGB (German Civil Code) for 24 months, starting from the date on the purchase receipt.

Within the scope of liability, all parts that become damaged due to manufacturing faults or material defects will be replaced or repaired free of charge.

The purchaser must report any deficiency complaints immediately in writing.

Claims by the purchaser for damages due to material defects or for whatever legal reason will not be accepted.

Any damage or failure caused by the following are also excluded from liability

- Incorrect use,
- Natural wear and tear,
- Intervention by third parties.

We accept no liability for damage caused by force majeure or transport.

Repairs due to a complaint about a defect do not extend the warranty period for the replaced parts or for the product.

10 Recycling

Polycarbonate manholes are made of fibreglass-reinforced polycarbonate (PC-GF6) and can be recycled.

At the end of their service life, dispose of the manholes professionally in accordance with the respective applicable national and local regulations. Recycle the substances or materials of polycarbonate components made of PC-GF6 where appropriate recycling facilities are available.

Remove metal components, seals or other foreign materials before disposal, and dispose of them sorted separately. Do not dispose of these components in household waste. Correct and proper disposal and recovery conserves resources and reduces the impact on the environment.

11 Quality management

The Langmatz GmbH quality management system is certified to DIN EN ISO 9001.

12 Disclaimer/Warranty

The information in this technical document is presented appropriately and correctly in compliance with the technical regulations, and to the best of our knowledge. However, this does not confer any guarantee of particular properties. In this context, the operator of the Langmatz GmbH products is expressly obliged to decide, based on their own judgement, whether the products are suitable and appropriate for the application or use being considered. The product liability accepted by

Langmatz GmbH relates exclusively to our conditions of sale, delivery, and payment. Langmatz GmbH accepts no liability on the basis of random, indirect and resultant consequential damage, or of any damage attributable to any use of the product other than its intended purpose as described.

13 Contact

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