HIDDEN GUTTER SYSTEM GALECO

Installation instructions

1. Notes before installation

1.1 Installation of the HIDDEN GUTTER System should be performed on the basis of the design documentation prepared by the architect responsible for the given construction site. Any attempt to mount the system without previously prepared documentation may cause the system to malfunction.

1.2 o ensure optimal functionality and system tightness, we recommend using highly qualified designers and roofers.

1.3 Installation of the GALOCO HIDDEN GUTTER System should be performed using dedicated materials described in this Manual.

1.4 The Galeco HIDDEN GUTTER System should not be installed when ambient temperature is lower than 5 °C.

1.5 Drawings given in this Manual are of an informational nature only, and cannot be used as working documentation.

1.6 When designing the Galeco HIDDEN GUTTER System for a given building, special attention should be paid to reinforcing the external wall structure and the tie beam in narrowings.

1.7 Variable parameters such as roof pitch, method of tie beam reinforcement, rafter plate-tie beam connection, roofing material, dimensions of the roof truss elements, rafter plate foundation height and thickness, and the type of roof insulation differ in each building. The parameters should be selected individually depending on the project.

1.8 The gutter system should be installed to straight sections so that it does not have vertical and horizontal deviations other than variation allowable by the applicable standard for a given base the system is mounted on, resulting from the the way the overlap connections gutter-gutter, gutter-outlet, gutter-corner, cover-cover are made.

1.9 System gutters can be mounted horizontally or with a small slope of 1 mm per 1 running meter. If a slope is required, allow for the difference in height of the cover fixed to the brackets , which amounts to about 1 cm per 10 running meters of gutter.

1.10 Overlap assembly of components made of sheet metal can cause natural deviations in straightness of the long components.

1.11 Installation of the Galeco HIDDEN GUTTER System should be carried out when insulation of the building is installed, so that drainage components can be installed inside the insulation.

1.12 Downpipes of the Galeco HIDDEN GUTTER System must be completely hidden in the wall and connected below ground level to the storm water drainage system.

1.13 The system should be designed and installed in such a way to avoid connecting the downpipes at angle in the wall and so that pipes hidden in the façade does not run vertically without any slopes.

1.14 The Galeco HIDDEN GUTTER System should be designed and installed in such a way that no cold bridge/freezing points occur behind the gutter and the downpipe and to ensure effective transfer of moisture away from the insulation layers.

1.15 The minimum thickness of the outer wall insulation layer the system can be installed in is 16 cm. If the outer insulation layer is thinner than 20 cm, a groove must be cut in the load-bearing wall. The downpipe groove in the building wall should be at least 30 cm wide and should have depth according to architectural drawings adapted to the implemented project

1.16 If it is not possible to make a groove in the wall, the insulation material thickness behind the downpipe should be increased accordingly or material of better parameters should be used to eliminate cold bridges.

1.17 In the area where the downpipe is routed, insulation should always be placed behind the downpipe. If the insulation layer is too thin, it is also possible to place insulation material in front of the downpipe, but cold bridges must be eliminated in this area of the external wall as a first priority.

1.18 In order to ensure the long-term and effective operation of the Galeco HIDDEN GUTTER System, inspection and gutter cleaning should be carried out at least twice a year. If the building structure is subject to significant exposure to external factors, the system should be checked more often. Inspection and maintenance of the gutter system should include removing all debris (leaves, needles, etc) from the gutter, checking that the downpipes and drainage components are clog-free and removing all dirt from the sediment tank.

1.19 The manufacturer recommends installation of Galeco baskets for additional protection of the drainage line against leaves and other foulants **(Fig. 1)**

1.20 In order to avoid damage to the system caused by snow and ice, it is recommended to install snow fences and the heating cable system offered by Galeco **(Fig. 1)** - heating cable assembly instructions are available at www.galeco.pl in the tab Downloads/Installation instructions.

1.21 The manufacturer allows slight differences in shade or gloss within products of the same colour due to different technological process used in the production of powder coated elements.

1.22 The Galeco HIDDEN GUTTER System works on the principle of gravity, not a vacuum drainage of rainwater.

Fig. 1

2. System design

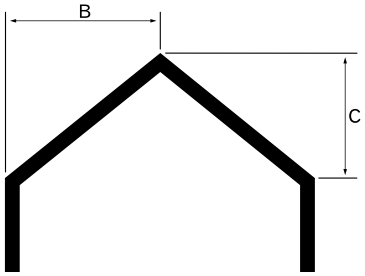
Due to the complexity of the system and its installation in a wall groove inside the building insulation, the system should be designed by a professional architect at the stage of creating the building architectural and construction design.

When designing a Galeco HIDDEN GUTTER System, take the following into consideration:

- the number of long components: gutter, cover, downpipe
- the number of gutter fittings: bracket, butt connector, outlet, right and left end cap
- the number of downpipe fittings: elbow, sleeve, clamp, Ø 80/110 adapter, sedimentation tank
- To calculate the number of the downpipes correctly, the capacity of the system and good building practices must be taken into consideration.

The recommended distance between successive downpipes is 12 meters.

After comparing the table data with the surface to be drained, choose a suitable number of downpipes for a given building. The data in the table specify the maximum roof surface from which a single downpipe of the system can drain water, with the downpipe situated at the corner or on the wall.



Roof area in m ² =
(C/2 + B) x roof length.

Capacity table

Downpipe positioning	System efficiency*
	90 m²
	180 m²

The above calculations are made on the assumption that precipitation intensity is 75 mm/h and the maximum roof pitch is 50 degrees. For roofs having a pitch lower than 10 degrees or flat roofs, the maximum Effective Roof Area equals the roof area.

3. Gutter installation

3.1 The gutter should be positioned in relation to the roof end in such a way that the theoretical line drawn as its extension passes over the outer edge of the gutter (see the example application in **(Fig. 2)** and that rainwater falls into the gutter. If due to the construction of the roof, the line passes below the outer edge of the gutter, snow fences should be installed on the roof to protect the gutter from damage caused by sliding or piled up snow.

3.2 Design the position of the gutter relative to the future façade. For this purpose, determine the protrusion of the rafter edge beyond the outer edge of the load-bearing wall using the formula

X = Y - 14 - Z

X [cm] - distance of the rafter protrusion inside the cavity

Y [cm] - insulation thickness + façade finish

Z [cm] - fascia board thickness

16 [cm] - width measured from the cover front to the rear surface of the bracket

3.3 Install a fascia board of a material which will guarantee no horizontal and vertical deformations and resistance to external conditions. The fascia board should be mounted so that its face constitutes a single, smooth and vertical surface. The surface should not have longitudinal slope in any direction.

3.4 It is recommended to install a horizontal shelf together with the fascia board, which will provide the necessary support to install the verge trim properly.

3.5 The thickness and type of insulation behind the downpipe should guarantee elimination of cold bridges. For this purpose, making an additional groove behind the pipe may be required, according to Points 1.15 and 1.16 of this Manual. **(Fig. 2)**

3.6 Fill the groove with insulating material **(Fig. 3)**

3.7 For proper operation of the system, it is necessary to install a verge trim, which is one of system components supplied by Galeco . The length of the trim is 2 meters **(Fig. 3)**. The verge trim can also be made by the roofer on site **(Fig. 4, 5)**

3.8 Verge trim made on site should meet four basic requirements:

- it should have a slope in the horizontal section of a minimum of 94°, enabling moisture to be moved away from the façade **(Fig. 4-5)**
- the vertical part of the verge trim should have a minimum height that will cover the entire part of the eaves board above the gutter;
- the verge trim should have a drip on its outer part enabling moisture to be moved away from façade;
- the horizontal part of the verge trim should have a minimum width so that the above drip protrudes a minimum of 1 cm beyond the face of the finished façade.

3.9 In order to ensure 100% tightness of the verge trim (both factory made and roofer made), elements must be joined with each other tightly e.g. by an adhesive with 7 cm overlap or using a flat seam.

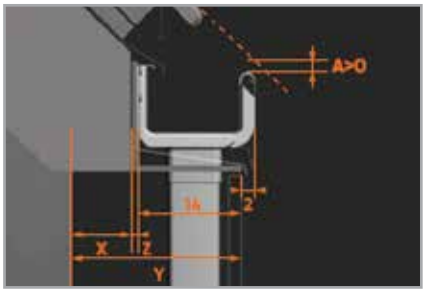


Fig. 2

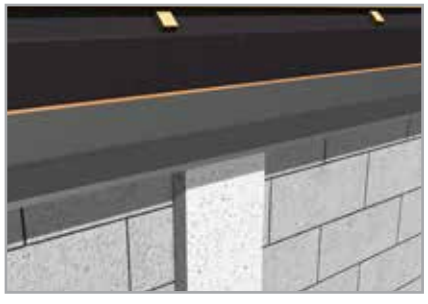


Fig. 3

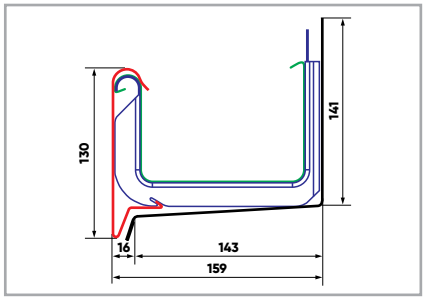


Fig. 4

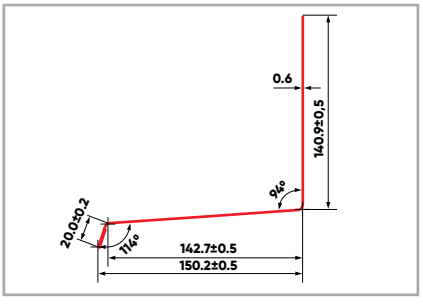


Fig. 5

3.10 The verge trim joints should be displaced in relation to the gutter/gutter, gutter/outlet, gutter/corner connection by a minimum of 50 cm. After installation, the bottom shelf of the verge trim should have its slope directed outwards.

3.11 The next step is to install special fascia brackets, forming the cover frame. Set the beginning and the end of the gutter line and tighten the end brackets **(Fig. 6)**

3.12 Stretch a string between the outermost brackets, draw a line and mount the remaining brackets. The maximum recommended bracket spacing is 60 cm. **(Fig. 7-8)** - show the correct installation of the brackets.

3.13 Brackets should be installed to the left and right side of the outlets, expansion joints and corners at a maximum distance of 15 cm. **(Fig. 9)** shows the proper installation distance from the expansion joint.

3.14 The outlet passage through the verge trim is a critical area. Cut out a rectangular hole in the verge trim where outlet is to be installed so that the sleeve can be inserted. The hole should not be wider than 5mm measured from the sleeve/ offset/elbow **(Fig. 10)**

3.15 Connect the outlet with the gutter with an overlap joint. Cut the horizontal part of the drip on both sides of the outlet at a distance of 7 cm measured from the end of the element, then bend it vertically to create mounting plates **(Fig. 11-12)**. Cut the outlet lip at a distance of 7 cm from the end of the component, then cut the bottom part horizontally from the cut to the edge to allow connection with the gutter **(Fig. 12-13)**. Spread sealing adhesive on the inside surface of the outlet. Install the gutter in the outlet by bending the previously prepared drip plates.

3.16 If the wall is insulated using the light wet method, before installing the outlet apply the sleeve with glued seal. If the insulation is to be covered with additional cladding or the wall is to be made using three-layer technology, depending on the conditions an offset or an elbow should be used instead of the sleeve .

3.17 Place the joined components in the verge trim opening **(Fig. 15)**

3.18 Install the gutter in the hooks and in the outlet **(Fig. 16-17)**

3.19 Bend the hole flange to the shape of the sleeve.

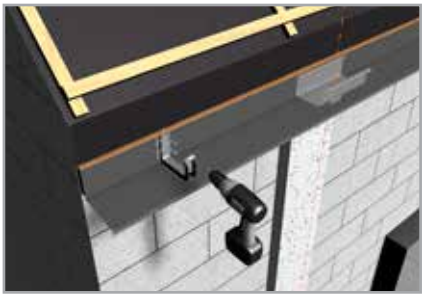


Fig. 6

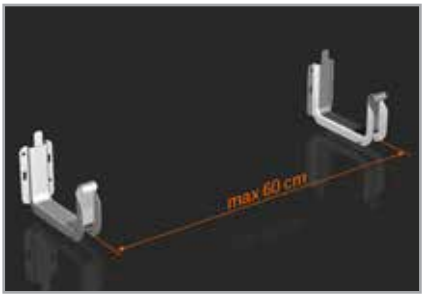


Fig. 7

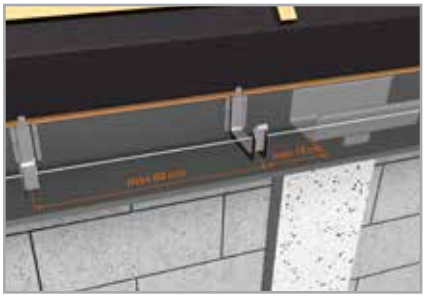


Fig. 8

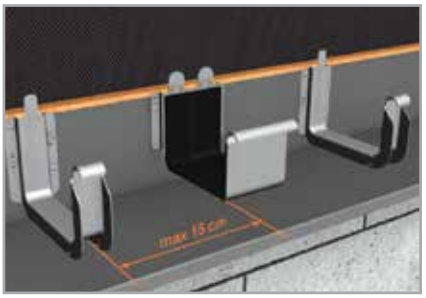


Fig. 9

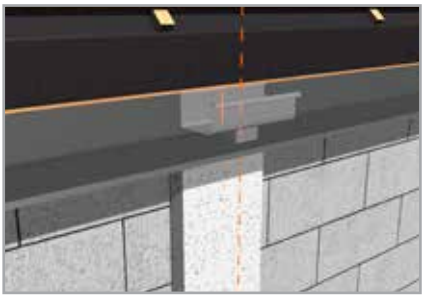


Fig. 10

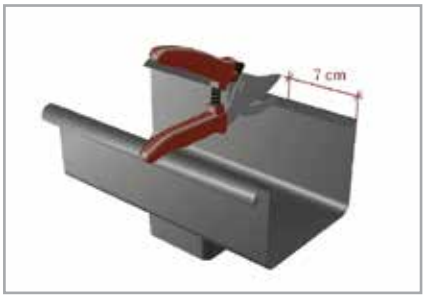


Fig. 11

Fig. 12

Fig. 13

Fig. 14

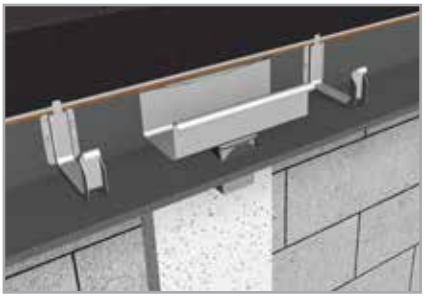


Fig. 15

Fig. 16

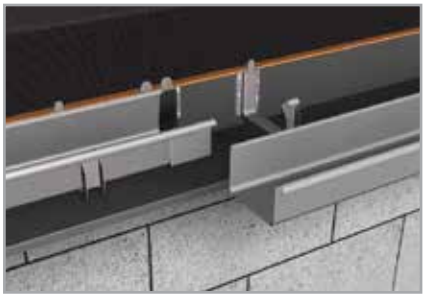


Fig. 17

3.20 Seal the area where the sleeve, offset or elbow pass through the verge trim with Galeco sealant **(Fig. 18)**

3.21 Finish installation of the gutters in the brackets, starting from the outlets.

3.22 The recommended way to connect horizontal components, i.e. gutters with gutters, gutters with outlets, and gutters with corners, is to connect them with a 7 cm overlap and glue with Galeco polymer adhesive for steel . Elements joined using an overlap joint can also be connected with soft solder (applies to LUXOCYNK material). An alternative method of joining gutters with gutters and gutters with outlets is to utilise expansion joints . If this method is chosen, a distance of 5-10 mm should be maintained between the joined components. When connecting using glue or soldering, the length of one gutter section of the gutter line should not be greater than 12 running meters If the gutter section is longer than 12 running meters or on pyramid roofs, expansion joints should be utilised.

3.23 The manufacturer allows sealing of expansion joints with Galeco polymer adhesive for steel.

3.24 Corners in the HIDDEN GUTTER System should be mounted directly behind the gutter using glue for steel, and then pressing the glued surfaces and bending the back plate of the corner.

3.25 Components made of steel should be cut with a hacksaw or sheet metal shears. Protect the edges with touch-up compound.

3.26 Install the end cap first before installing the last gutter. The end cap should be mounted using glue for steel supplied by Galeco. Apply the glue supplied by Galeco on the inner surface of the end cap and put the end cap on the tip of the first gutter. Drill and screw to the back flange of the gutter. Apply the glue on the inside surface, where the edge of the gutter touches the end cap **(Fig. 19-20)**

3.27 Bend the fascia bracket assembly plates **(Fig. 21)**

3.28 After installing the system components, carry out a leak test by plugging the outlet and filling the gutters with water. If any of the connections leak, seal it additionally using sealing adhesive supplied by Galeco.

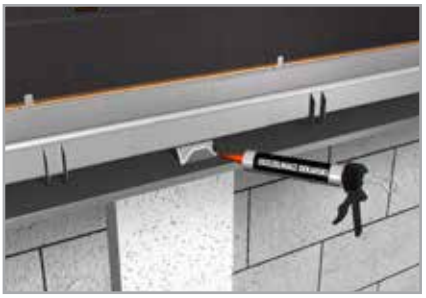


Fig. 18

Fig. 19

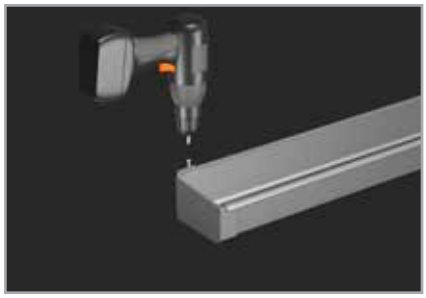


Fig. 20

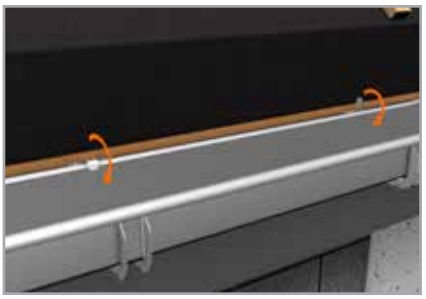


Fig. 21

4. Downpipe installation

4.1 Install the first wall plug not lower than 15 cm under the outlet **(Fig. 22)**

4.2 Set locations and install other wall plugs with a spacing not greater than 1.8 running meters **(Fig. 23)**

4.3 Install the clamps on the plugs.

4.4 Install the first downpipe under the outlet. Apply aggressive adhesive for PVC supplied by Galeco on the lower part of the component (sleeves, offsets or elbows) installed on the outlet and slide the pipe on to ensure tightness of the glue joint.

4.5 Tighten the first clamp firmly **(Fig. 24)**

4.6 Install the next clamps with a spacing not greater than 1.8 running meters, but do not tighten too much to allow for thermal movement

4.7 Other pipes should be connected using a sealed sleeve. The sleeve seal should be glued to the top edge of the sleeve using cyanoacrylate glue (Super Glue type). Slide the sleeve joined with the bottom pipe on the end of the upper pipe. Leave 2 cm of clearance between the end of the upper pipe and the maximum depth of the sleeve, to allow vertical thermal movement of the pipe **(Fig. 25-28)**

4.8 Install the remaining downpipes, observing the above installation principles until you reach the ground level .

4.9 Install a 110 mm drainage elbow clamp **(Fig. 29-30)**

4.10 The soil below the last downpipe should be compacted. Where the downpipe is joined with the sewage pipe, a foundation made of lean concrete should be prepared. Minimum thickness of the lean concrete is 20 cm and minimum width 40x40 cm

4.11 Install the sealed sleeve and the Ø 80/110 adapter at the end of the last pipe . Continue the installation with fittings for underground sewage system Ø 110 mm.

4.12 To drain the condensate that may appear on the down pipes at the foundation level, the pipe should be lined with waterproof material and fitted with an air grate a minimum of 1 m above the ground level **(Fig. 31).**

4.13 Finish installation of the Galeco HIDDEN GUTTER System Ø 110 mm by mounting the sewer pipe leading to the gully

Fig. 22

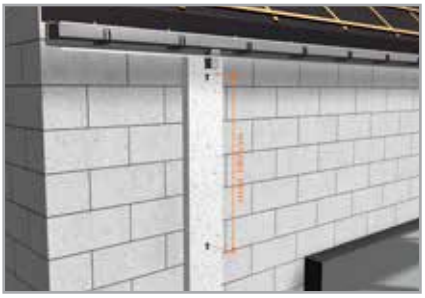


Fig. 23

Fig. 24

Fig. 25

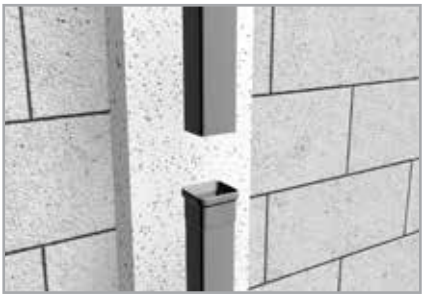


Fig. 26

Fig. 27

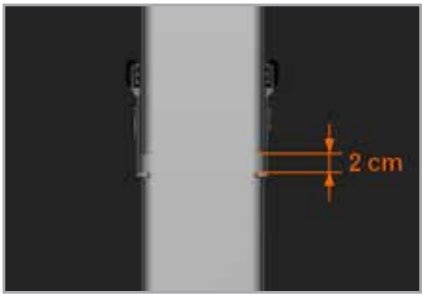


Fig. 28

Fig. 29

Fig. 30

Fig. 31

Fig. 32

5. Installation of the gully

Galeco offers a complete set including a sump, a separator, a basket and a cover-grate. Correct installation procedure for the gully should be carried out in several stages. **(Fig. 33)**

- excavate the ground **(Fig. 34)**
- compress cement mix - PCB **(Fig. 35)**
- construct the lower layer of the concrete band - class B30 **(Fig. 36)**
- level the gully with H20 mm concrete mortar **(Fig. 37)**
- set and level the gully on mortar. Connecting the drain pipe **(Fig. 38)**
- pour the concrete band on the sides of the gully. It is obligatory to mount a grate or cover **(Fig. 39)**
- apply 2 mm concrete adhesive mortar **(Fig. 40)**
- lay paving or other surface at a level 5 mm higher than the tray **(Fig. 41)**

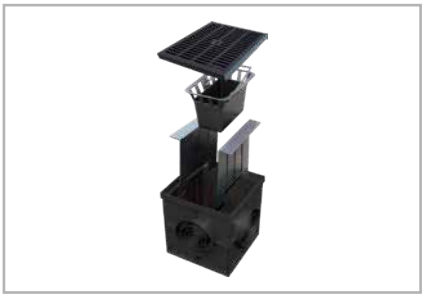


Fig. 33

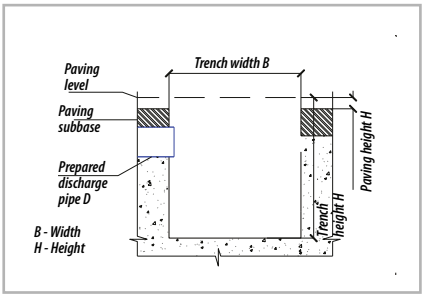


Fig. 34

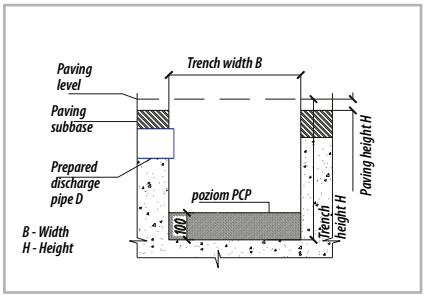


Fig. 35

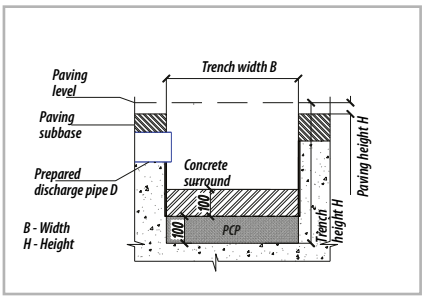


Fig. 36

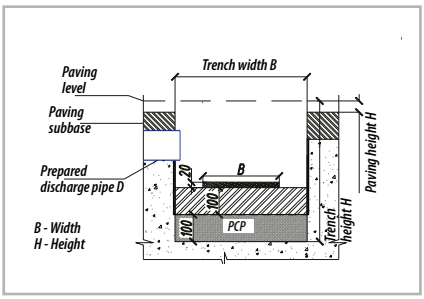


Fig. 37

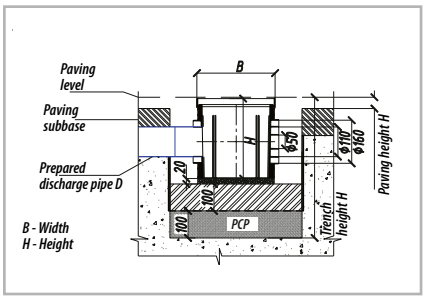


Fig. 38

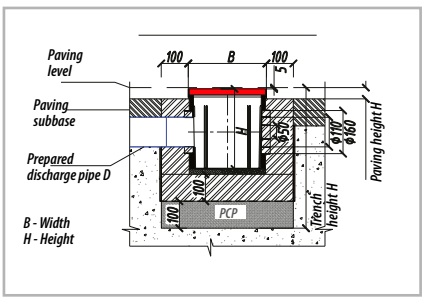


Fig. 39

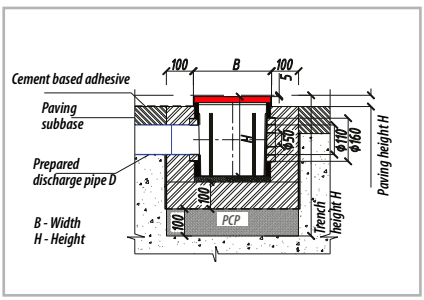


Fig. 40

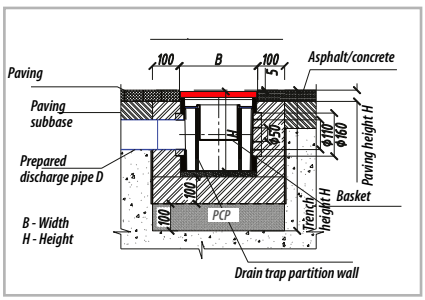


Fig. 41

6. Mounting the covers

6.1 Covers used in the the Galeco HIDDEN GUTTER System are long components used for covering the gutter. The cover is mounted by locking on the fascia brackets **(Fig. 42)**. 6.5 The face of the cover should be flat and homogeneous all over its surface. Slight deflections of the cover resulting from the natural properties of the cover and bracket material are allowable.

6.2 The cover of the Galeco HIDDEN GUTTER System is fitted with protruding "lap plates" from one side of the component that allow one cover to be inserted in the other, without having to trim the corners. **(Fig. 43-44)**. The cover is the last component to be installed Galeco to complete the HIDDEN GUTTER System. The cover should be installed when the gutter line is fully assembled. It is recommended that the cover installation be carried out by two people. Put two covers on the gutter and then snap them on the bottom area in the bracket locks by pressing (not hitting) the cover-bracket connection area gently by hand. **(Fig. 45-46)**. Then slide one cover into the other to achieve a smooth connection between them. **(Fig. 47-48)**. Protruding "overlap plates" on the outermost cover should be cut using sheet metal shears or a hacksaw.

6.3 Before commencing installation, remove the protective plastic from the covers and check for any distortions that would affect the appearance of the components after assembly.

6.4 To connect the covers in the corners, use the dedicated internal/external cover corners. The cover corners can also be used in order to make a side cover of the gutter end caps.

Fig. 42


Fig. 43

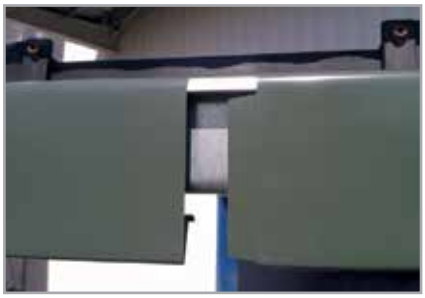


Fig. 44

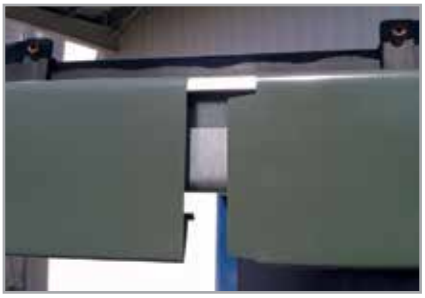


Fig. 45


Fig. 46


Fig. 47


Fig. 48

Galeco Sp. z o.o.
ul. Uśmiechu 1
32-083 Balice k/Krakowa

galeco@galeco.pl
www.galeco.pl