## 02.04 Installation instructions for RAUSIKKO Boxes SC/S/HC/H

### 02.04.01 General

**Danger due to lack of stability**
These installation instructions must be followed to avoid jeopardising the stability of the gravel trench.

The RAUSIKKO Box is used for building rainwater management systems.
Detailed information on products can be found in our price list for rainwater management (print no. 838350).

The basic types RAUSIKKO Box 8.6 SC and RAUSIKKO Box 8.6 S can be used to ensure an optimal, project-related assembly of such systems.

For special installation cases where a particularly large load bearing capacity is required, the heavy-duty variants RAUSIKKO Box 8.6 HC and RAUSIKKO Box 8.6 H are additionally available.

The dimensions of the boxes can be found on page 21.

### 02.04.02 Overview of system components

RAUSIKKO Box 8.6 SC

RAUSIKKO Box 8.6 S

RAUSIKKO Box 8.3 SC

RAUSIKKO Box 8.3 S

RAUSIKKO Box 8.6 H

RAUSIKKO Box front grille

RAUSIKKO Box connecting clip

The RAUSIKKO Boxes can be arranged one after another, next to each other and on top of each other. A few combination options are displayed below:

RAUSIKKO Box 8.3 S on RAUSIKKO Box 8.6 SC

RAUSIKKO Box 8.6 S on RAUSIKKO Box 8.6 SC

The company commissioned with this is solely responsible for a professional installation.

When building percolation systems with RAUSIKKO Boxes, no gravel is actually required to fill the gravel trench, unlike conventional pipe gravel trenches.

When assembling multi-layer box systems, the boxes are fixed on top of each other using integrated push-fit sockets.

Push-fit socket connection on the top and bottom of the box

When fixing together multi-layer box systems, the connecting clips depicted below may also be used.

RAUSIKKO Box with inserted connecting clip

The RAUSIKKO Boxes can be combined in a variety of ways and can therefore be adjusted for the conditions and requirements on-site. The design guidelines should be taken into account.

## 02.04.03 Installation conditions

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When using RAUSIKKO Boxes S/SC in a gravel trench or reservoir system which is accessible to vehicles, (generally*) a minimum covering of 0.8 m and a maximum installation depth of 4.0 m must be observed. For RAUSIKKO Boxes H/HC a maximum installation depth of 6.0 m should be generally observed.

The height of the gravel trench or reservoir system must not exceed 2.7 m.

The ground underneath the boxes must have sufficient load bearing capacity. If necessary, corresponding measures to increase the load bearing capacity are to be taken.

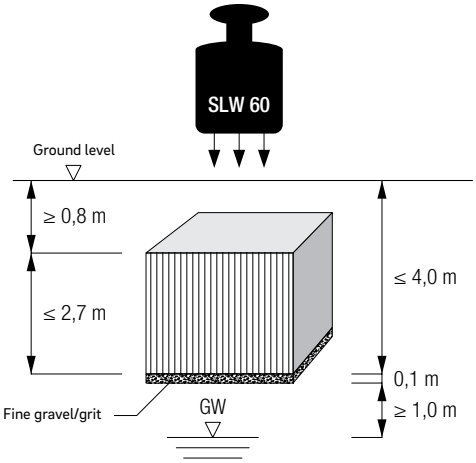
The systems should not be installed where there is permanent or occasionally occurring ground, stratum or impounded water. In the case of percolation systems, the relevant recommendations of work sheet DWA-A 138 are to be considered. According to this, the distance from the highest average groundwater level should be at least 1.0 m.

Under the conditions described above and taking into account the following installation guidelines, the ground surface on top of and next to the boxes may be loaded with a maximum traffic load corresponding to SLW 60 in accordance with DIN 1072 (heavy goods vehicles with a total weight of 60 t and a wheel load of 100 kN or a compensating distribution load of 33.3 kN/m²).

These conditions are also to be maintained throughout the whole construction period. The construction site is to be organised accordingly. In particular it is to be ensured that no cranes, silos, containers, construction or excavated materials, which could lead to a larger single or surface load than described above, are placed above the gravel trench or reservoir system.

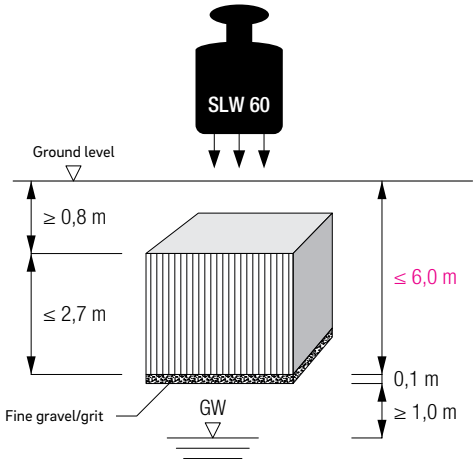
Installation conditions which deviate from this – in particular deeper installation depths – require an individual assessment and are to be clarified with the REHAU Applications Engineering Department. Approval of these alternative installation conditions is ultimately given by the company commissioned with the installation and/or the construction supervisor or planner.

**Standard installation conditions*) for the RAUSIKKO Box S:**




*) Native soil of soil types G1 to G3 according to DWA work sheet A 127 (friable and non-cohesive soils and also cohesive mixed soils and silts)

**Standard installation conditions*) for the RAUSIKKO Box H:**

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For installation under classified road surfaces, observe the guidelines' specifications for standardising the roadbed (issue 2012).

### 02.04.04 Transport and storage

The RAUSIKKO Boxes are supplied stacked and strapped onto palettes.

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The stack can be unloaded using a forklift or wheel loader. To unload the boxes, insert the fork of the fork-lift or wheel loader into the bottommost box in the stack. Unloading must be carried out with care. The stack must not be knocked over or dropped.


Unloading the RAUSIKKO Boxes

- The RAUSIKKO Boxes can be stored outside.
- They are to be placed on level and solid ground.
- The stack height must not exceed 2.7 m.
- The maximum permissible open-air storage time is one year.

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The boxes are to be stored in such a way that they are protected from direct sunlight (stored in the shade or covered with a light geotextile fabric). In the latter case, ensure that no heat builds up underneath the cover. If this is not possible, sub-surface installation should only take place once the boxes have cooled to ambient temperature (if necessary, in the morning of the next day).
Frost and low temperatures will reduce the impact resistance of the material.

### 02.04.05 Preparing excavation pits and bedding

The applicable legislation on accident prevention during excavation and also the applicable standards for digging excavation pits and trenches are to be observed.

- The length of the trench equates to the length of the gravel trench plus working area.
- The width of the trench equates to the width of the gravel trench plus working area.
- The trench depth of a box-gravel trench equates to the height of the gravel trench plus the top fill height and the height of the fine gravel bed (see below).
- The trench depth of a ditch-gravel trench (with a box-gravel trench underneath the ditch) equates to the depth of the ditch plus the depth of the gravel trench (according to design) and also the thickness of the top soil layer (normally 0.3 m) and the fine gravel bed (see below).
- The base of the trench must be free of stones, smooth and completely flat. The load-bearing capacity and permeability of the base must be at least equal to the natural ground. For systems without traffic load, we recommend an $E_{v2}$ value of at least 30 MN/m$^2$ and for systems with traffic load, a value of at least 45 MN/m$^2$. If necessary suitable measures are to be taken (soil replacement, re-compacting, etc.).

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On the base, an approx. 10 cm-thick bed of fine gravel or grit (grain size of 2/5 or 2/8 mm) must be built. The bed is to be laid thinly and evenly using suitable equipment (planer or similar). Laying the bedding is to be carried out with great care.

### 02.04.06 Laying geotextile filters

The box-gravel trench is completely covered with the RAUMAT Non-woven separator and geotextile filter (min. 150 g/m$^2$) in order to prevent the permeation of fine soil particles.

The geotextile should be laid perpendicular to the length of the trench. Meaning: Length of the geotextile channel = circumference of the gravel trench + 0.5 m overlap. The lengthways overlap and the overlap on the front ends should also be approx. 0.5 m.

1. Fasten both ends of the geotextile temporarily to the edges of the trench, the trench walls or the trench sheeting.
2. Where there are pipe penetrations, cut the geotextile fabric cross-wise.

3. Install the RAUSIKKO Boxes after laying the geotextile fabric. See section  for how to install RAUSIKKO.„02.04.07 Boxen einbauen“
4. Once the boxes have been installed and all chamber connections have been fitted, remove the RAUMAT Non-woven separator and geotextile filter from the edges of the trench and lay it across the RAUSIKKO Boxes with a 0.5 m overlap at the edge of the geotextile.

RAUSIKKO Box gravel trench with RAUMAT geotextile filter

Ensure that the geotextile fabric lies tightly against the boxes and no earth gets between the RAUSIKKO Boxes and the geotextile fabric.

5. Cover the front of the gravel trench with a pre-cut piece the size of the surface area of the front end plus an approx. 0.5 m wide overlap.

If the boxes are only going to be used to store rainwater (for example, as quench water cisterns), cover the boxes with a liner sheet instead of a geotextile filter, so that they are watertight. The liner sheet is to be protected against mechanical damage on both sides with a protective membrane (e.g. staple fibre fleece with 500 g/m²).

Rainwater tank with foil cover

### 02.04.07 Installing boxes

1. Check the storage elements for damage before installation.
   Damaged elements must not be installed.
2. Arrange the boxes according to the design specifications (one after another, next to and on top of each other).
   Position the boxes in such a way that the imprinted lettering “RAUSIKKO Box” runs from bottom to top or from top to bottom.

Installing the RAUSIKKO Boxes

3. Close the front ends of the gravel trench with a front grille. The plates with dimensions W× H = 0.28× 0.3 m are provided with a saw matrix for connecting KG pipes DN 110 to DN 200.
   The grille plates come with clips and are latched into the front sides of the boxes. No other connecting elements are required.

Front grille after installation

## 02.04.08 Connections and chambers

### Pipe connections

A front connection branch with preformed KG spigots DN 200 or DN 250 are available to ensure a precise, level connection. The front connection branches come with clips and are latched into the front sides of the boxes.

Front connection branch DN 200 or DN 250

Channel pipes AWADUKT PP DN 110, 160 or 200 are directly connected to the front end of a box-gravel trench. For this, cut out the corresponding saw matrix of the front grille using a jigsaw. Then insert the KG pipe spigot.

Cut-out saw matrix with a KG pipe inserted

Due to the wall thickness of the KG pipe, a slight bed drop will occur between the base of the cleaning channel and the base of the KG pipe during connection.

For connecting pipes with a nominal diameter of DN 315 or higher, the connection adapter DN 315–DN 500 and the C3 chamber can be used (see section "02.06 RAUSIKKO connection adapter DN 315–500" on page 55).

For side inflows into the rinsing, inspection and cleaning channel of the RAUSIKKO Box 8.6 SC, there is a special pre-assembled box with a side inlet (see section "02.01.02 Connection options for RAUSIKKO Box S/SC/H/HC" on page 26).

### Chambers

- The RAUSIKKO Chambers DN 600/1000 or the RAUSIKKO C3 system chamber are used as inlet, inspection or cleaning chambers.
- RAUSIKKO Function chambers are used as throttle chambers.

Details on how to install chamber systems can be found in the corresponding installation instructions; see chapter "08 RAUSIKKO chambers" on page <?> ff.

Connecting the ventilation to the chamber extension using AWADOCK

### 02.04.09 Filling the excavation pit

1. The working area next to the gravel trench or rainwater tank is to be filled with friable, stone-free soil which can be compacted (sand or gravel, soil group G1 according to DWA work sheet A 127) in 0.3 m-thick layers.
2. The filler base should be compacted in layers with a light to medium-weight vibration plate with a maximum compaction force of 3 t. The Proctor density and permeability of the filler must be at least equal to that of the existing ground.

Compacting the work area

3. Before spreading the ground for the coverage, the boxes should be topped with a 0.1 m-thick sand levelling layer.
4. The ground is then spread on top of the boxes in layers by way of front filling and using a light digger or wheel loader with a total weight of max. 15 t.
   These machines can only be driven over a sufficiently compacted layer of ground comprising G1 material with a thickness of at least 0.5 m.
   Only the vibration plates (no vibro-tampers!) described above may be used to compact the ground in the first filler layer. Above a compacted covering height of 0.3 m, compaction may also be done with heavy vibration plates (maximum compaction force of 6 t).

   Heavy construction vehicles with a maximum wheel load of 50 kN (SLW 30) are only permitted to drive over a compacted covering that has a minimum height of 0.8 m.

In the case of ditch-box gravel trenches with a percolation ditch and a box-gravel trench underneath, the ditch overflow is spread across the boxes once the geotextile filter has been folded back. A 0.1 m-thick layer of sand is then put on top of the gravel trench and a 0.3 m-thick layer of top soil on top of that. The ditch is then profiled with the intended border incline and if necessary, covered with a ditch planting grid (to be procured separately).
It is to be ensured that no construction vehicles drive over the percolation ditch of the ditch-gravel trench!
Where there is ditch overflow, the sand and top soil layer is recessed into a funnel shape. This funnel is filled with coarse gravel of grain size 8/32 until the ditch overflow is covered.

### 02.04.10 Determining operational measures

- If possible, do not make the percolation system operational until the catchment area has settled and is green again.
- Ensure good drainage during the construction period.
- As rooting in the percolation system is to be avoided, only plant shallow-rooted plants in the vicinity of the percolation system.
  In the case of existing or newly planted trees, the distance between the tree trunk and the edge of the gravel trench should be at least equal to half the diameter of the crown of the tree.
  If this minimum distance cannot be observed, the top side of the gravel trench and the side surface facing the tree should be covered with a geotextile root protector. Where the root protector (to be procured separately) intersects, there should be an overlap of at least 0.5 m.

Percolation ditch of a completed ditch-gravel trench

- RAUSIKKO Chambers and inlets/outlets of the cleaning channels should be inspected every six months and also after heavy rain and accidents; any contaminants which could be present are to be removed.
- If necessary, the RAUSIKKO Boxes' cleaning and distribution channels can be high pressure cleaned with up to 120 bar. Flushing heads in accordance with the Hamburg model, as described in RSV data sheet 1, with 4 + 4 jet nozzles and a nozzle spray angle of 30° are suitable for this. No hitting tools or chain spinning tools may be used.
  Any contaminants washed out into the sand trap of the connection chamber are to be extracted.

RAUSIKKO Box cleaning and distribution channel