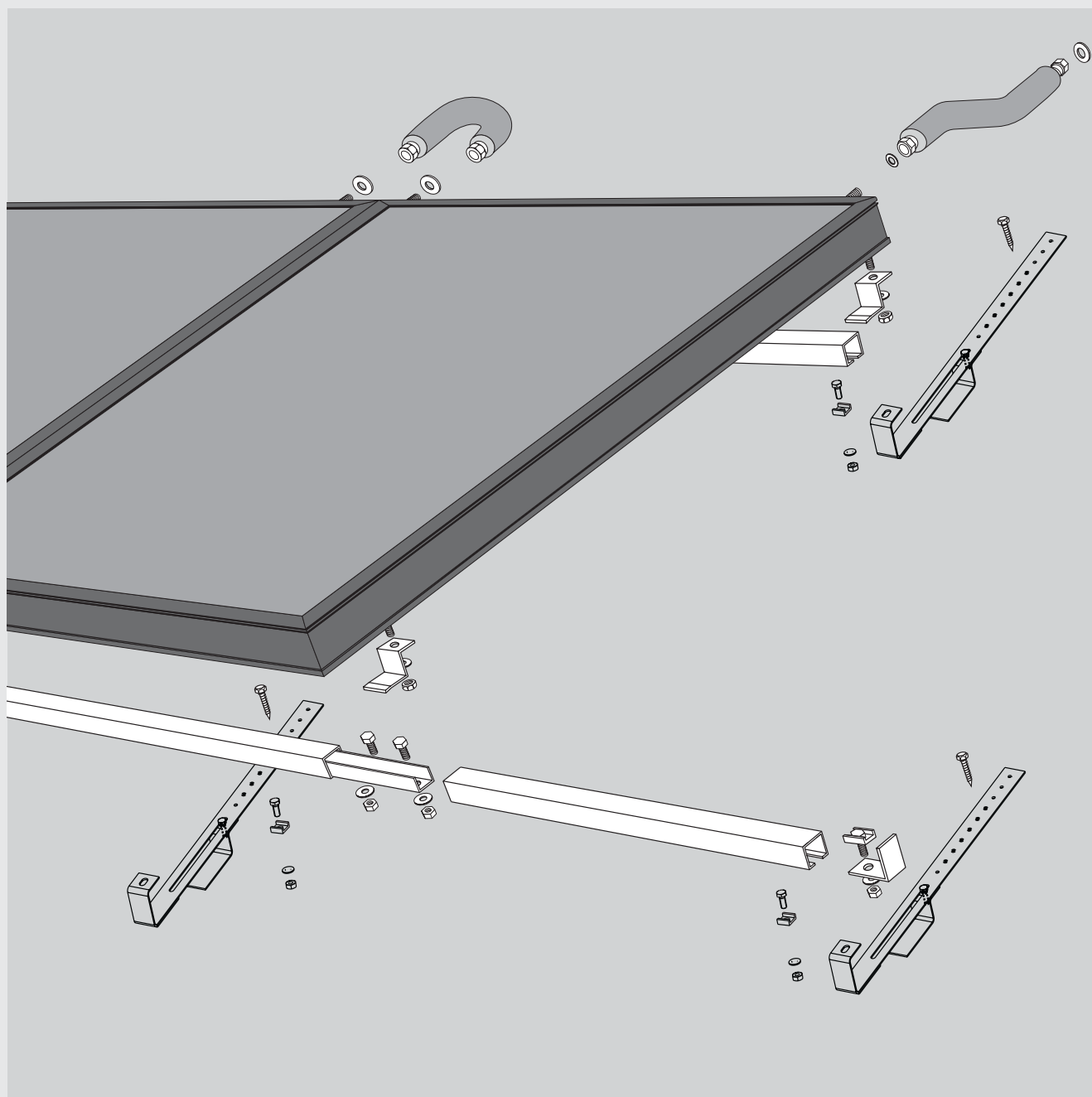


F2 FLAT COLLECTORS MOUNTED ON-ROOF INSTALLATION INSTRUCTIONS

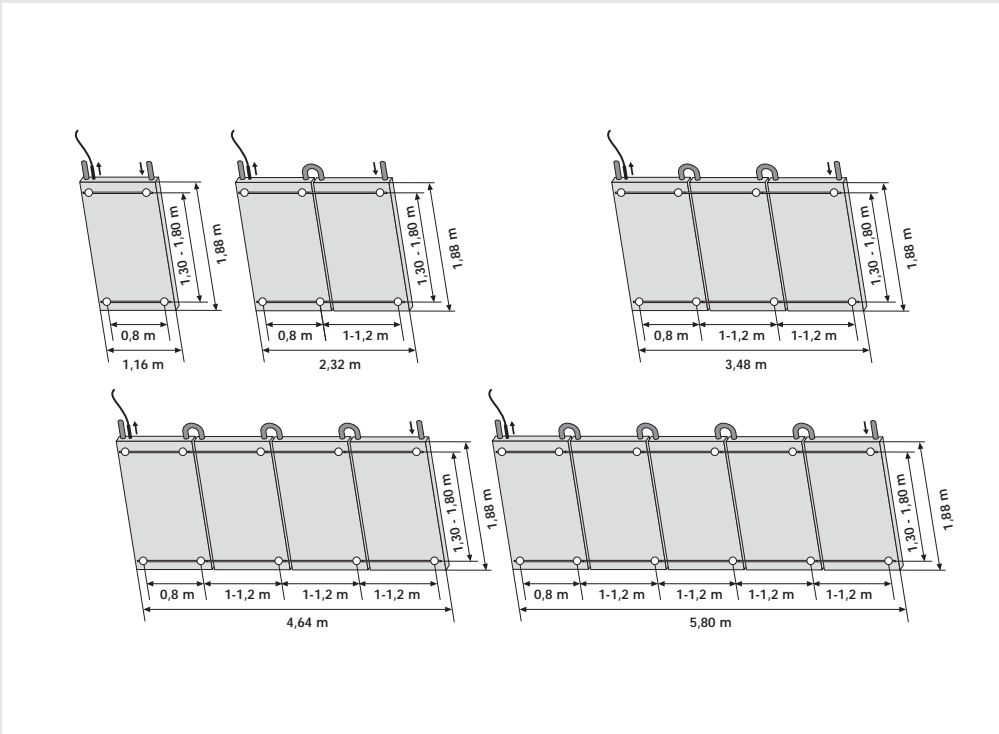


Installation requirements

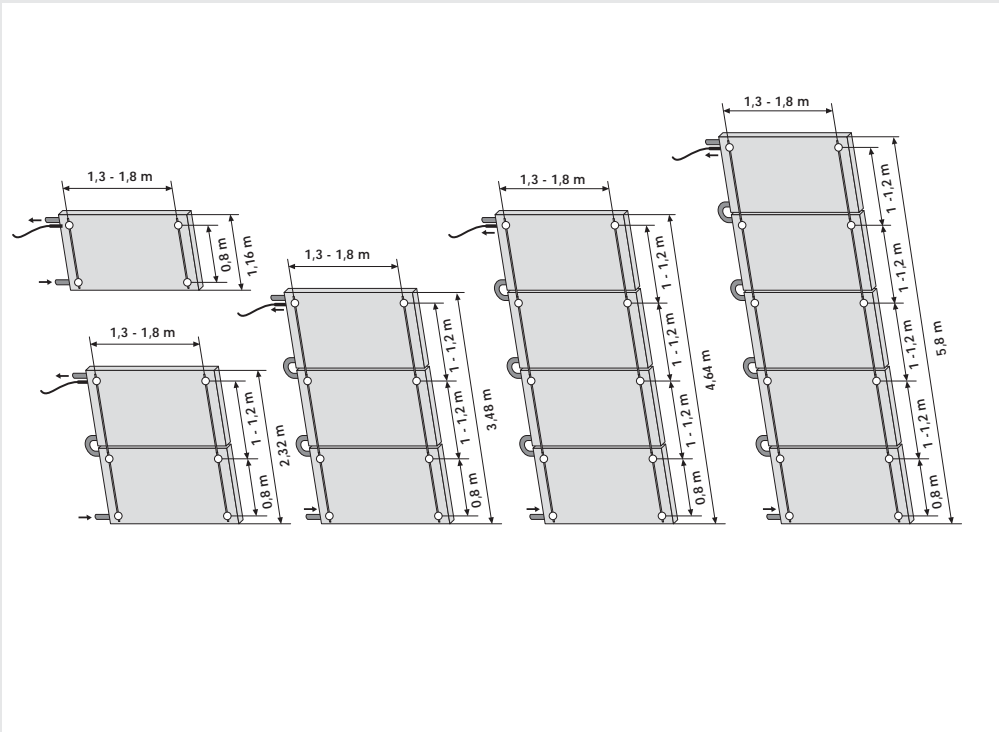
■ General premises	<p>The on-roof installation set is suitable for installing Roth F2 flat collectors on roofs that have a slope greater than 22°. Different rafter anchor types are available for roofs with flashing made of roofing tile/roofing brick and similar roofing slabs, as well as plain tile and corrugated asbestos cement slabs. Mounting on roofs made of natural slate should be carried out only by companies employing professional slaters.</p>	<p>Please note: You may require additional materials, e.g.: ventilating tiles to provide roof feed-throughs for collector field connections (available from specialist roofing and construction materials dealers), possibly also wood shims for shoring up rafter anchors, sheet metal for sealing around rafter anchors with plain tile flashing. The equipment required for transporting the collectors to the roof is to be included in the overall planning.</p>
■ Safety information	<p>Read these installation instructions carefully before beginning installation and comply with the safety instructions contained therein.</p> <p>Applicable industrial safety regulations and the rules of technology are to be observed, particularly when working on roofs (see Page 8). Because of statics considerations, please contact the Roth hotline for situations subject to snow pressures of Zone 4 and above and for installation sites that exceed 600m above sea level.</p>	<p>Important: When storing the collectors prior to installation, make sure that they are neither left outdoors nor stored lying on their glass surfaces and/or uncovered, because otherwise moisture could make its way into the ventilation holes located in the frame. When installing the collector connections, make sure that they are annealed. For that reason, always press hard when tightening the 1/2" thread connection! Non-compliance with this instruction could lead to damage to the collector!</p>
■ Potential equalisation and lightning protection	<p>The metallic solar circuit pipes are to be connected to the main equipotential busbar with a green/yellow copper conductor (H07 V or R) at least 16 mm². If a lightning protection installation is present, then the collectors can also be linked to it. Earthing can also other-</p>	<p>wise take place by means of a ground rod. The earth cable is to be laid outdoors against the house. The earthing bar is also to be connected with the main potential equalisation rail through the use of a wire with the same cross-section.</p>
■ Sensor installation	<p>The sensor is to be mounted in the last (i.e., most downstream) collector on the side of the leader (hot outlet). The rubber sleeve is to be removed for this purpose, the sensor is to be threaded through and the rock wool in the interior of the collector is to be pushed a little to the side. Then apply some heat conducting paste to the sensor and insert it as far as possible into the immersion sleeve. To complete the process, push the rubber sleeve back in</p>	<p>until the counter lip engages with the collector frame. A cable with a cross-section of 2 x 0.75 mm is sufficient for extending the sensor cable up to 50 m, beyond which a cross-section of 2 x 1.5 mm is to be used. It is expedient to protect the connected control unit against overvoltage by lengthening the collector sensor to include an overvoltage protection casing (optional) immediately after the collector.</p>
■ Tools overview	<ul style="list-style-type: none">• Spanner 13/17/19/20/22• Drill, crosshead bit PZ 3• Angle grinder with stone disc• Hammer• String (circa 10 m), measuring tape, cord• Pencil	

Systems variants

Vertical collector alignment

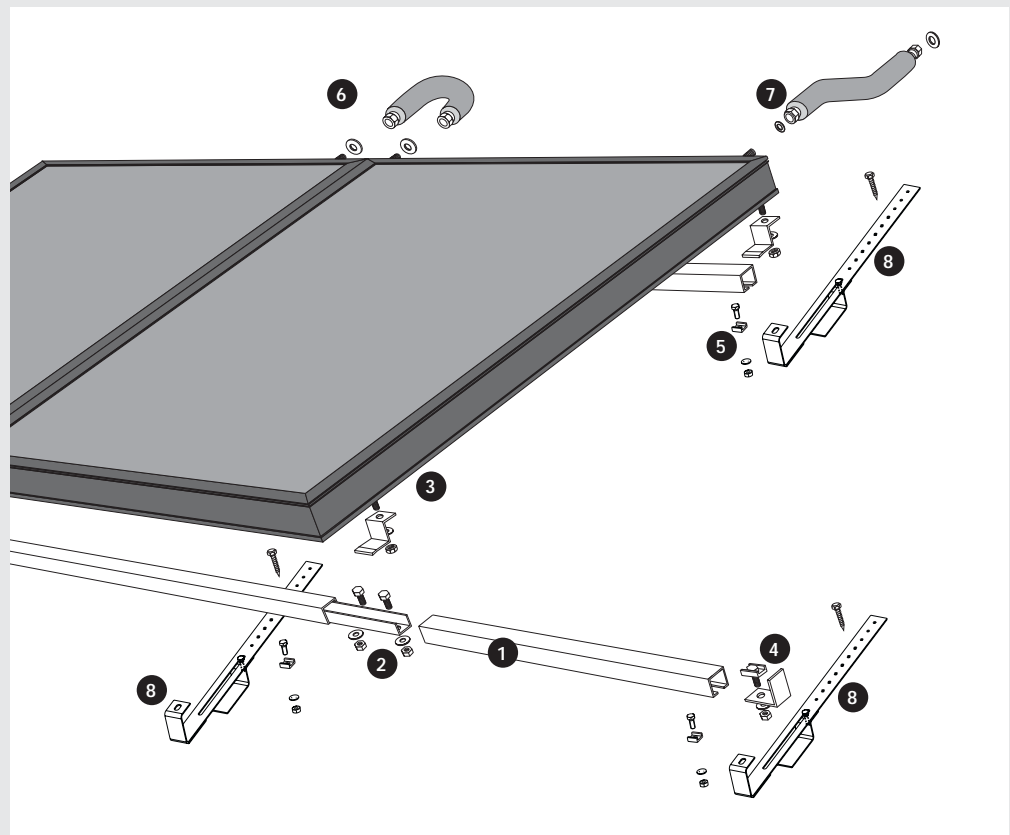


Horizontal collector alignment



Materials overview

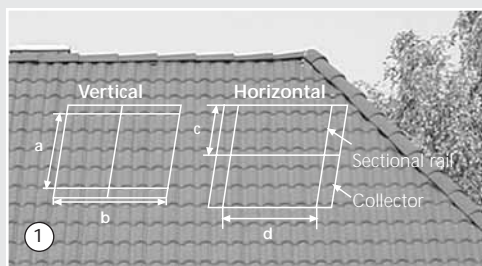
System components



Basic on-roof installation set for horizontal or vertical F2 flat plate collector alignment

Material	Basic set for two collectors (Quantity)	Supplementary set for each additional collector (Quantity)
1 Installation rail made of aluminium, length 1163 mm	4	2
2 sectional rail connection set (2 connection profiles, 4 hexagon bolts M 12 x 20 with nuts and shim washers)	1	1
3 Collector fastening set (4 Z-hooks, 4 hammerhead bolts M 8 x 20 with nuts and shim washers)	2	1
4 Terminal angle set (2 L-angles, 2 hexagon bolts M 10 x 30, 2 U-profile washers, 2 shim washers each)	1	-
5 Hexagon bolt made of stainless steel M 10 x 30, U-profile washer with shim washer and nut	6	2
6 Stainless steel corrugated hose with union nut 1/2", insulation 20 x 13 mm and gasket ring, L 300 mm	1	1
7 Stainless steel corrugated hose with insulation 20 x 13 and gasket rings, length 1000 mm	2	-
Accessory		
8 Roth attachment anchor universal vertical, incl. attachment screws	6	2

Installation instructions



1. Determination of the position of the collector field and accordingly of the roof hooks
 - For vertical installation:
 - Dimension a: 1.3 – maximum 1.8 m*
 - Dimension b: determined by the distance between the rafters and the number of roof hooks
 - For horizontal installation:
 - Dimension c: determined by the number of roof hooks and the height of the collector field
 - Dimension d: 1.30 – 1.8 m*, depends upon the distance between the rafters

* Dimensional specifications for only one collector field

■ Roof positioning



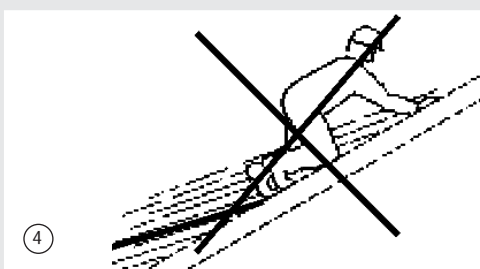
2. Fixing of attachment anchor universal.

■ Roof connection



3. **For your safety:** Always wear protective equipment when working in situations where there is a danger of falling.

■ Safety information



4. Do not step on attachment rail.

Installation instructions

Installation steps



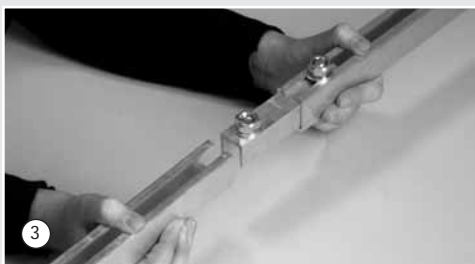
1. Fix attachment anchor universal with 3 screws 6 x 80 to roof lath. Attachment anchor universal must be positioned in the deep part of the tile.

Important:

The attachment anchor universal may not impose pressure upon the roof tiles.



2. Pre-assembly profile rails on ground. The screws for the connection of profile rails and attachment anchor universal must be inserted before joining the individual profile segments. For this purpose measure the position of the attachment anchor uni-versal and mark on the profile rails. At this spot insert 1 screw with U-profile disc each.



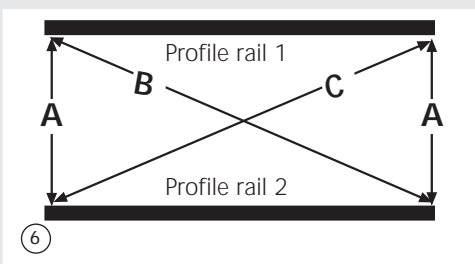
3. Then guide the connectors in the sectional rails in from the side and secure with M12 x 20 bolts.



4. End brackets pre-assembly: When the collectors are mounted vertically, the end brackets are installed on both sides in the lower sectional rail: when they are mounted horizontally, these are installed in both sectional rails. Insert the end brackets using one bolt each with a U-profile washer as far as possible into the sectional rail and bolt down tightly with a shim washer and a nut from below.



5. Screw on sectional rails with hexagon screws and U-profile washers through the slots of the roof hooks.

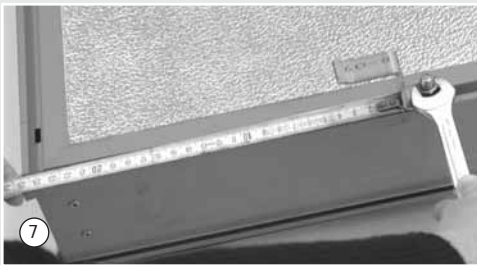


6. Determine parallel alignment by using a uniform dimension A. Use a string to check the diagonals of the sectional rails and correct any length differentials as needed.

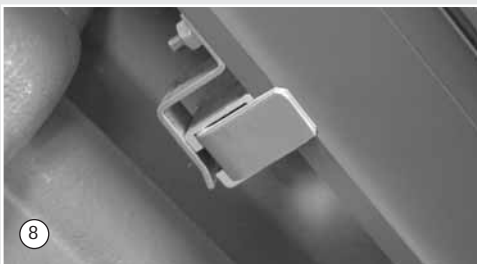
Once the dimension $C = B$, the sectional rails are flush in their alignment and can be bolted into place. Take care to ensure that the dimension A is not changed again during readjustment. It might be useful to mark the position of the rail on the roof hooks for this purpose.

Installation instructions

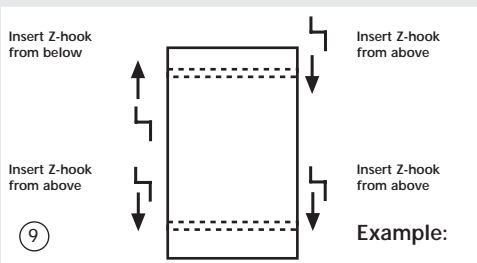
Installation steps



7. The positions of the Z-hooks are defined in accordance with the clearance of the sectional rails. Take a measurement and centre the Z-hooks on the back side of the collector with 8 x 20 profile screws. Mount the lower Z-hooks with the opened side facing downwards. When installing the collectors from right to left, provisionally mount the upper hook to the upper right-hand edge of the collector with the opening facing downwards and in the centre of the section on the left with the opening facing upwards. When installing the collectors from left to right, provisionally mount the upper hook to the upper left-hand edge of the collector with the opening facing downwards and in the centre of the section on the right with the opening facing upwards. This step simplifies the mounting process.



8. Mount the collector with the lower Z-hook in the lower sectional rail.



9. Then slide the upper Z-hook onto the sectional rail and screw it on. Slide the Z-hook protruding from the centre of the section from **below** over the upper sectional rail and screw it tightly. This will secure the collector against slipping out. Before mounting the second and all additional collectors, remove the protective foil from the sides which impact against one another.



10. To mount the sensor, first remove the rubber sleeve, thread the sensor through it, apply heat conducting paste and insert into the immersion sleeve as far as possible. Then push the rubber sleeve in until past the counter lip.



11. Make sure the flat gaskets are seated properly when mounting the corrugated hose hasps.

Installation instructions

Installation steps



12. One must press hard when tightening the threaded joints on the collector, otherwise the collector could be destroyed.

13. Prepare ventilator block (cut open grid) and separate as required any reinforced vapour barrier sheeting that may be present and fasten it in raised position and/or use adhesive collars (available from specialist dealers). Observe rising corrugated hose placement!

Industrial safety regulations Rules of technology

- On-roof installation: DIN 18338 regulations for roofing and roof sealing, DIN 18339 regulations for sheet metal roofing and wall covering work, DIN 18451 regulations for scaffolding work
- Connection of thermal solar installations: DIN 4757 Parts 1 and 3
- Electrical connection: VDE 0100 regulation for the erection of power installations, VDE 0185 regulations for lightning protection systems – general with regard to installation, VDE 0190 regulations for equipotential bonding in electrical installations, DIN 18382 regulations for electrical cable and line installations in buildings.

Detailed information concerning accident prevention regulations can be obtained from professional construction associations!

Use extension ladders correctly

Only use ladders that have height differentials of 5 m or less. Lean them at angles of between 65° and 75° and secure them. The stepping-off point must be at least 1 m below the top of the ladder.

Safety devices against falls

Safety devices against falls are required (VBG 37, §8) when working on inclined roofs (20° to 60°) where heights from which one could fall are > 3 m. Vertical clearance workplace safety device (roof scaffolding to catch falling personnel or objects or alternatively a wall barrier on the roof) maximum 5 m. A safety harness can also be used as a safety device to protect against falls. Mount safety roof hooks above the user on load-bearing building components. Do not use any ladder hooks!

Protection against falling objects

Shield routes where people or vehicles may be passing and working areas located below against falling or tumbling objects. The areas are to be designated and fenced off.

Information can also be obtained from the Roth hotline: Tel. (06466) 9 22-266

Roth

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