

GALLOWS-TYPE FALL ARREST SYSTEM Model: "BETA"

TECHNICAL SPECIFICATION AND ASSEMBLY INSTRUCTIONS



1.1 TECHNICAL SPECIFICATION, GENERAL DESCRIPTION OF THE FALL ARREST SYSTEM.

Gallows-type fall arrest system is a steel construction consisting of a few basic parts:

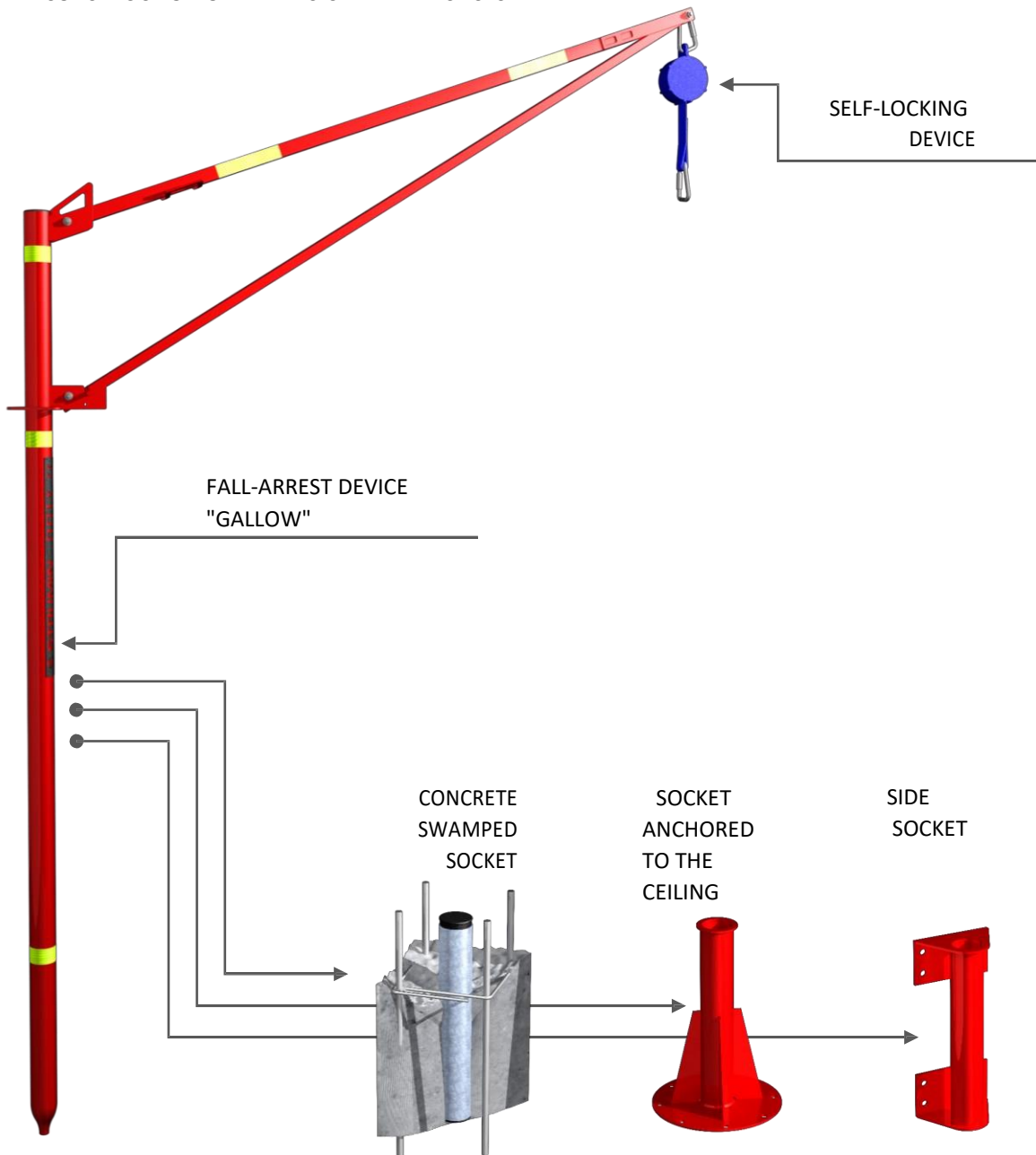
- Gallows-type fall arrest system
- Concrete swamped socket
- Socket anchored to the ceiling
- Side socket
- Socket plumbing device
- Self-locking device 3.5 m
- Self-locking device 6 m

FALL ARREST SYSTEM is available in several configurations which were presented below. A GALLOWS and a LIFELINE POLE may work with different system's elements, i.e. SOCKETS and HEIGHTS ADAPTERS. The use of a given solution is based on individual conditions on the construction site.

The corrosion protection of the elements is provided by the paint system.



1.2 CONSTRUCTION OF THE BASIC FALL ARREST SYSTEM.



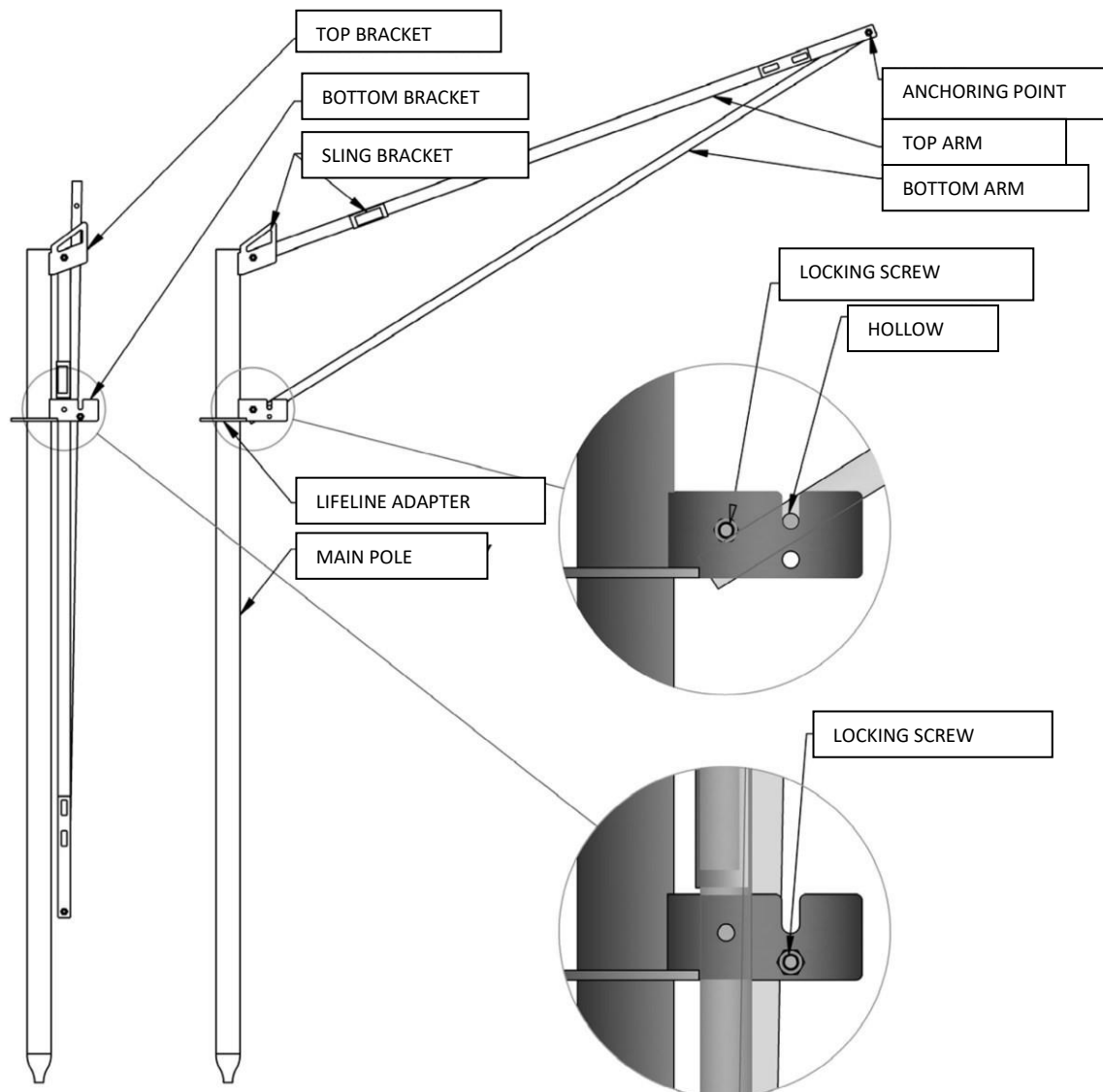
1.3 BASIC FALL ARREST DEVICE

The device consists of the main pole with the mounted catching arm.

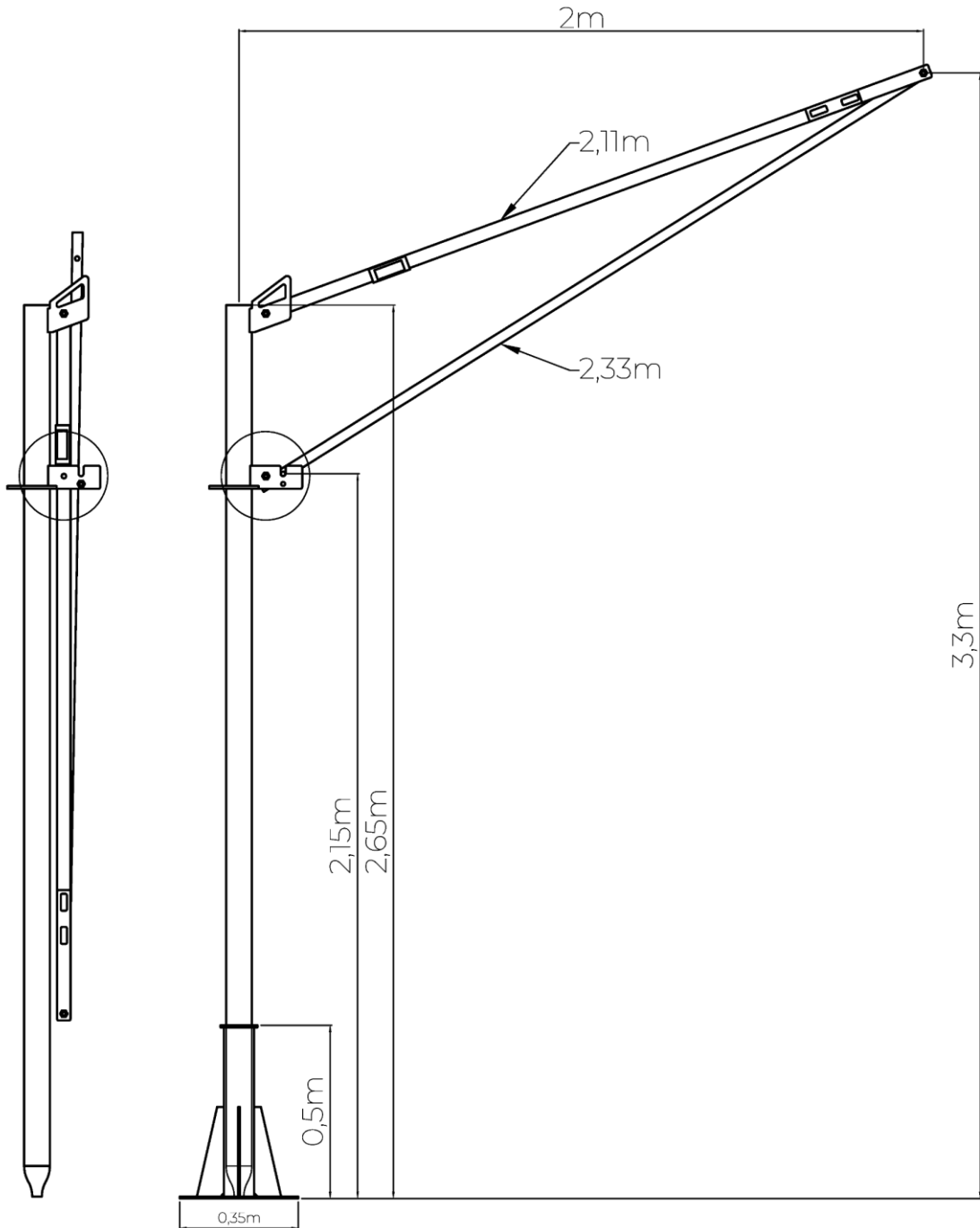
It is secured from opening with a blocking screw.

It blocks the bars of the catching arm when the device is transported and blocks the bottom bar after unfolding the arm. During operation of the device, the blocking screw must be assembled in the lower bracket of the main pole.

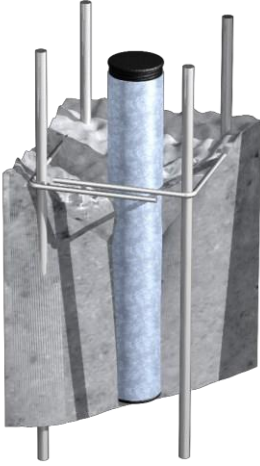
- Material:..... Paint-coated constructional steel
- Weight: 35 kg
- Height: 3.3 m
- Width after unfolding: 2.06 m
- Width after folding: 0.2 m



BASIC FALL ARREST DEVICE – MAIN DIMENSIONS



1.4 A CONCRETE SWAMPED SOCKET



A socket that is swamped in concrete during pouring the concrete on the building's elements, i.e. ceilings, columns etc. The distribution of sockets can be planned during the investment planning stage what helps to take advantage of the system's benefits, i.e. providing the ease of fall arrest device relocation

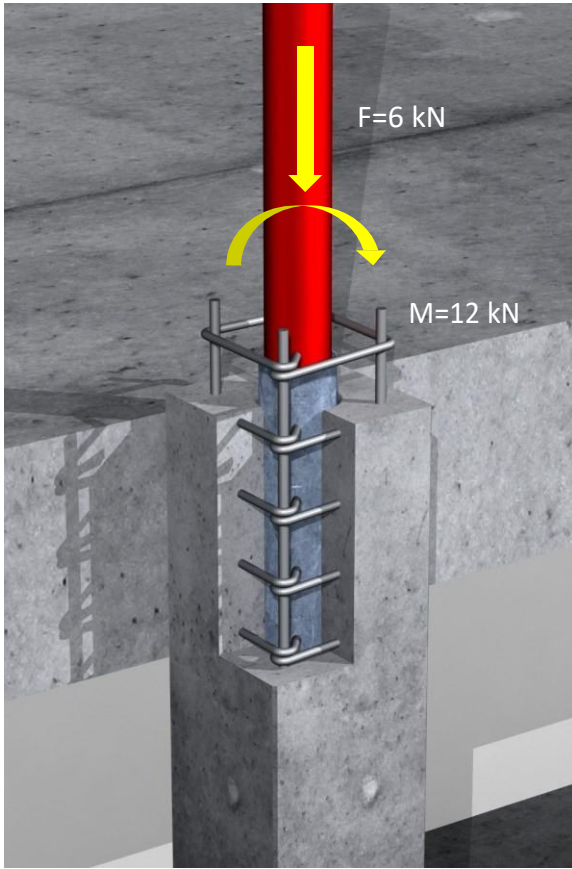
The concrete swamped socket may be used in columns, walls and ceilings that contain reinforcing elements (rods, stirrups etc.). In order to provide enough strength, the user should asses the concrete strength on the basis of the number of days since pouring, temperature and humidity. The site manager or an another competent person, as well as an authorized person on the ordering party's side are responsible for determining the required strength.

Material: Crude steel
Weight: 1.5 kg
Height: 0.5 m
Diameter: 89 mm

Works with:
basic fall arrest device, lifeline pole, socket plumbing device.



1.3B STRENGTH PARAMETERS OF THE POLES MOUNTED IN CONCRETE SWAMPED SOCKETS



Concrete swamped socket must be able to transfer the burden, as described in the standard EN-795:2012 which regulates the method of dead and dynamic loads testing in the gallows-type fall arrest systems. These burdens are 6 kN – axial thrust on the central pole of the gallows and 12 kN – bending moment of the central pole.

Testing load ranges of the anchoring point of the gallows or the lifeline system pole is in the sole responsibility of the site manager or the building manager.

Strumin determines only the strength level in the anchoring point that appears in case of an event in which the gallows saves its user from falling.

Technical parameters, i.e. the type and the class of the reinforcement used in a given case and the type and the class of concrete are not known to the system's manufacturer, and because of that the possibility to determine the potential use of the system must be verified by the site manager or the building designer.



1.4 SOCKET ANCHORED TO THE CEILING

A socket mounted to the ground with the use of screws and concrete
Ø12



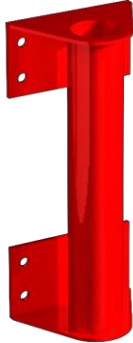
Minimum required anchoring strength is: $Q = 10 \text{ kN}$,
Recommended depth is 120 mm.
The socket demands 8 screws.

Material:	Lacquered steel
Weight:	20 kg
Height:	0.68 m
Diameter:	0.35 m

Works with: basic fall arrest device, lifeline pole.



1.5 SIDE SOCKET



A side socket is dedicated to assembling the FALL ARREST DEVICE to side surfaces if there is no possibility to assembly the steel base to a horizontal surface or there is no possibility to swamp sockets in concrete.

It is equipped with eight assembly points. Minimum required anchoring strength is: $Q = 10 \text{ kN}$ a recommended minimum anchoring depth is 100 mm.

Material:..... Paint-coated constructional steel
 Weight: 7 kg
 Height: 0.5 m
 Width: 0.22 m
 Depth: 0.17 m

Works with: basic fall arrest device, lifeline pole, socket plumbing device.

1.6 SOCKET PLUMBING DEVICE



Used as a supportive tool while assembling concrete swamped sockets, anchoring sockets and side sockets.

It helps to place sockets swamped in concrete in upright position and facilitates assembling.

Material: lacquered steel
 Weight: 6 kg
 Height: 0.9 m
 Width: 0.08 m

Works with: concrete swamped socket, ceiling socket, side socket.



1.7 Concrete screws



Characteristics:

- Self-tapping screws for concrete,
- Ø12 thread diameter,
- Ø10 mandrel diameter,
- Ø10 diameter of a hole drilled in concrete,
- galvanised,
- length 100 mm,
- Assembled with an electric screwdriver (wrench no. 15),

Works with: ceiling socket, side socket.



1.8 SELF-LOCKING DEVICE



Characteristics:

- self-locking device,
- self-clamping device,
- with nylon tape 3.5 m, 6 m,
- aluminium chassis,
- 1 automatic rotary snap ring with fall indicator,
- 1 steel snap ring, ref. no. 981.

In compliance with EN 360 standard

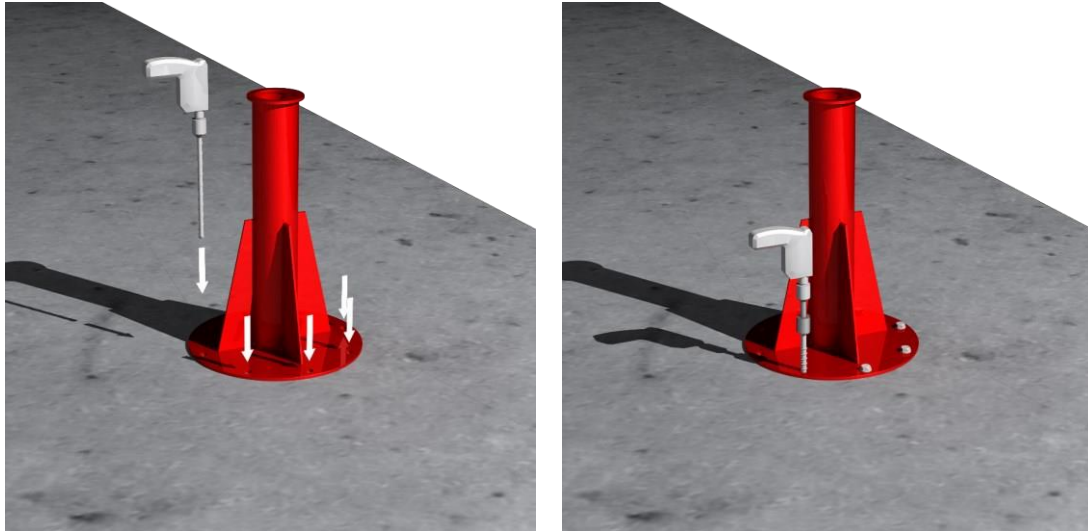
Works with:
 basic fall arrest device.



2.1 ASSEMBLY INSTRUCTIONS

2.2 MOUNTING SOCKETS ASSEMBLY INSTRUCTIONS

2.2.1 CEILING SOCKET ASSEMBLY INSTRUCTIONS



A ceiling socket is assembled to concrete with eight screws HUS 10×100.

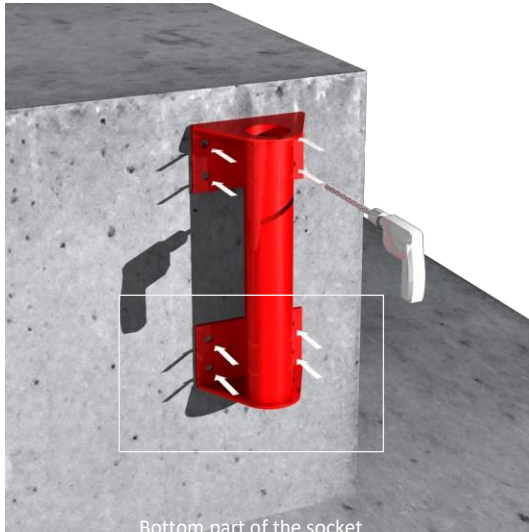
Ø10 holes should be drilled in the surface (depth ~16 cm).

The surface in which the holes are drilled should provide Q=10 kN resistance strength to pull out and minimum anchoring depth should be 10 cm.

Mount the screws to the surface with an electric screwdriver what in order to assembly the socket.



2.2.2 SIDE SOCKET ASSEMBLY INSTRUCTIONS



Bottom part of the socket



HUS 10×100.

A side socket is assembled with eight screws to concrete
 $\varnothing 10$ holes should be drilled in the surface (depth ~ 16 cm).

The surface in which the holes are drilled should provide $Q=10$ kN resistance
 strength to pull out and minimum anchoring depth should be 10 cm.

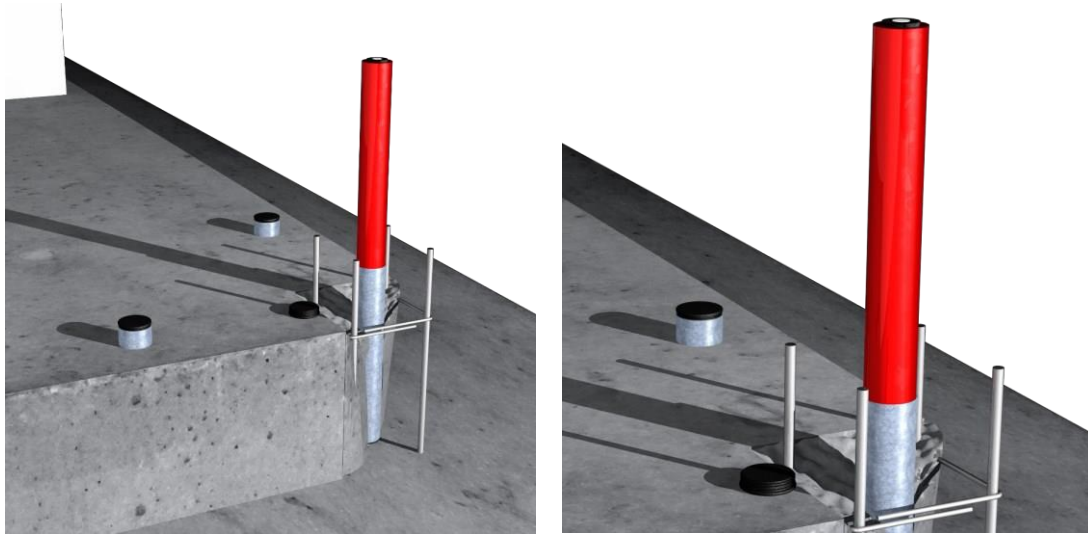
Mount the screws to the surface with an electric screwdriver in order to assembly
 the socket.

The number of screws used in the bottom part of the side socket is optional. The required number of screws
 here is 2.

Other holes are optional in case of some problems with assembling in
 neighbouring holes (e.g. reinforcement bar).



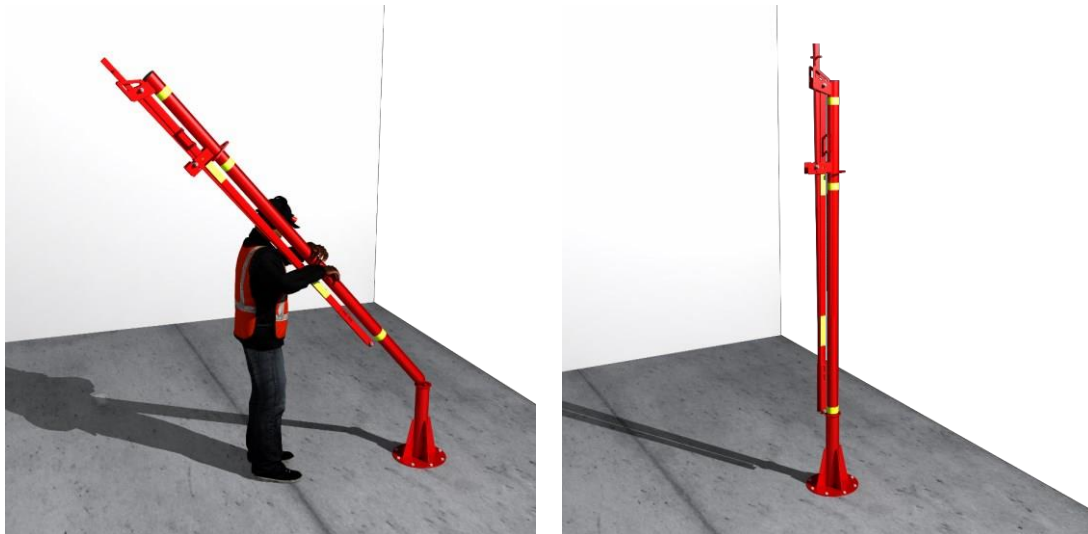
2.2.3 CONCRETE SWAMPED SOCKET ASSEMBLY INSTRUCTIONS



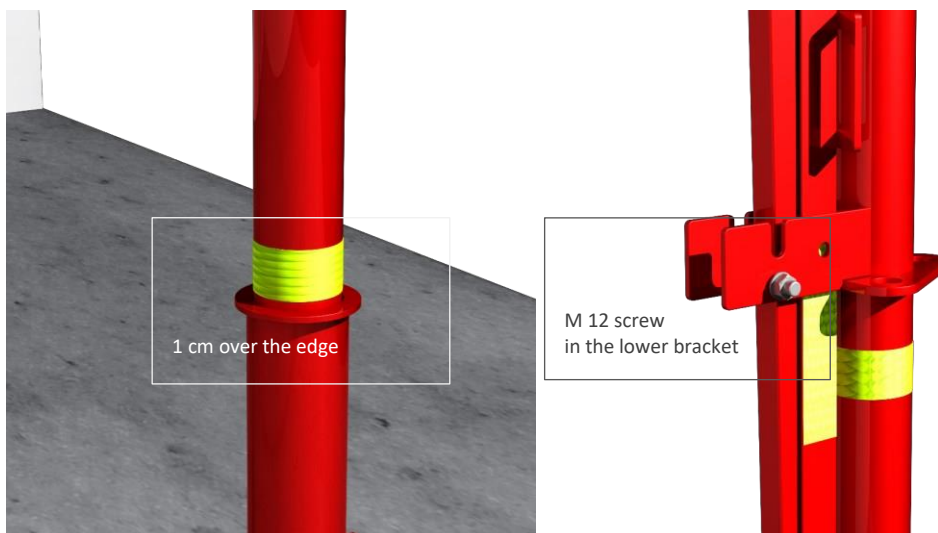
A concrete swamped socket is assembled with a plumbing device. The socket is swamped in concrete while pouring it on columns, ceilings etc. The socket should be placed upwards (depth around 46 cm, total height of the socket is 50 cm). Afterwards, the socket must be covered with the provided plug. The plug guarantees cleanliness inside the plug and protects the slurry (and other substances) from getting inside what might make the socket inoperable once dried.



2.3 GALLOWS ASSEMBLY INSTRUCTIONS

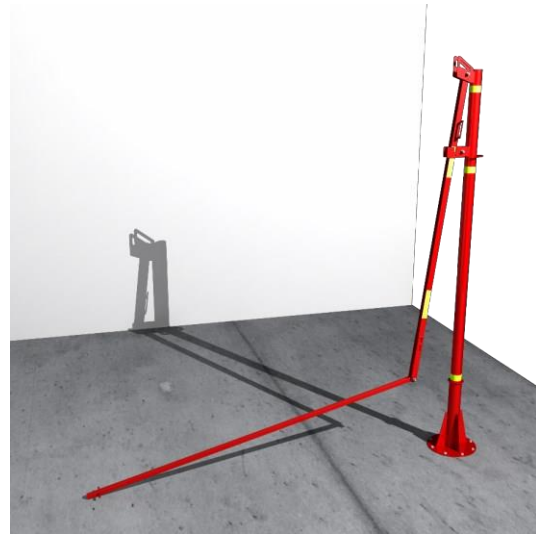


The gallows should be placed inside the ceiling socket mounted earlier (or side socket/concrete swamped socket) – manually or with the use of a crane (look pictures below). During the gallows assembly in the socket, the user should pay attention to the insertion depth of the main pole – the marker in the bottom part of the pole should be about 1 cm over the top edge of the socket.



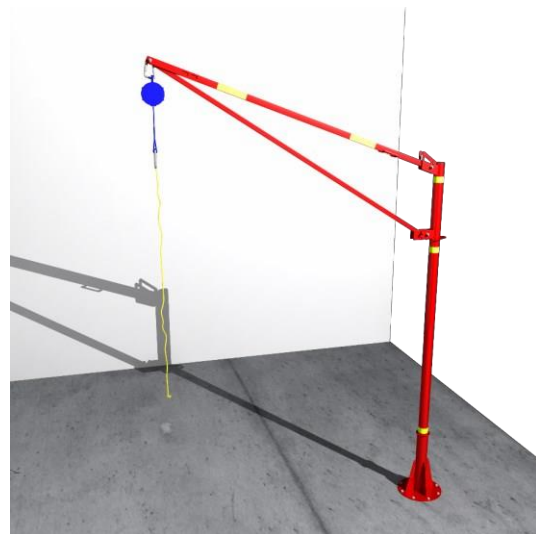
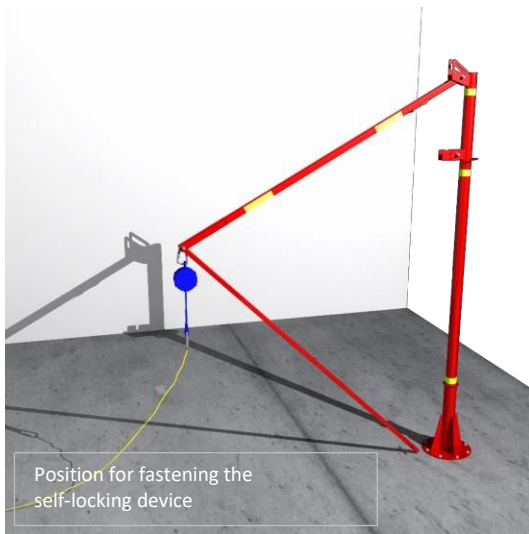
After inserting the gallows in the socket, its arms should be unlocked. In order to do that, remove the M12 screw and keep it until the locking of the arm in the bracket (after unfolding the gallows' arms).





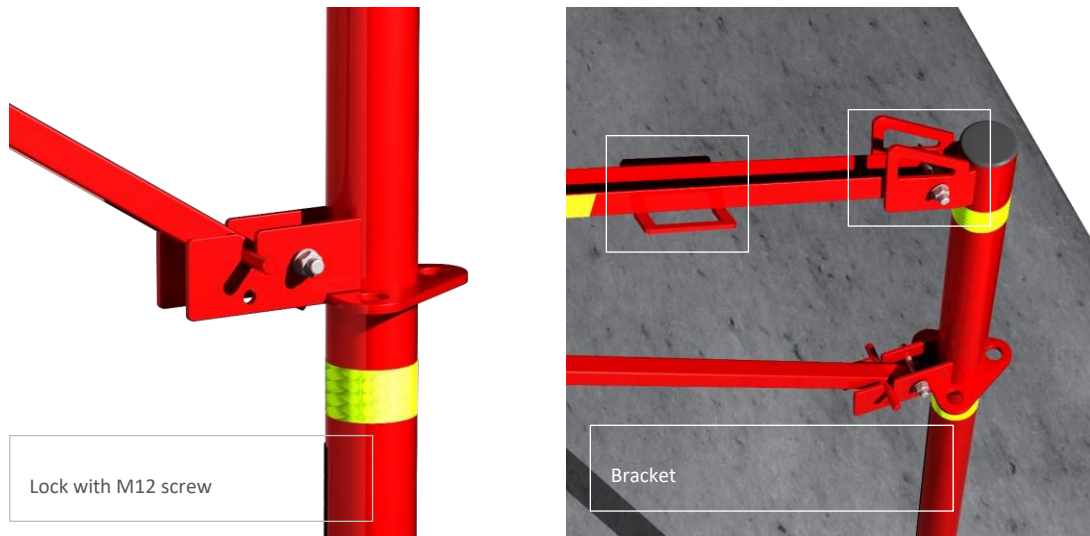
After removing the screw of the bottom bracket, you may unfold the arms: bottom and top, until they reach the position indicated in the picture. Then, you should twist the gallows arms until they reach the position that allows to fasten the self-locking device.

→ More information on pages 15-17.



After fastening the self-locking device, place the end of the bottom arm in the bottom bracket of the gallows and lock it with M12 screw (as in the picture). It is practical to assembly a rope to the anchoring tape snap ring in order to make the self-locking device easier to access during operation.





The gallows may be transported with a crane. In order to do that, two available sling brackets should be used: one is placed on the central pole and the other on the top arm.

In case of any difficulties with pulling the gallows out of the socket (e.g. due to contamination of the socket with concrete), you should use only the bracket on the central pole. Tugging and using excessive force to pull the gallows out will damage the upper arm.

Transporting with a crane may be performed when the gallows is unfolded or folded. The sling bracket on the top arm was chosen in order to make the central pole keep the upright position (with the self-locking device mounted).

2.4 INSTRUCTIONS FOR DISASSEMBLING THE GALLOWS

Disassembling of the gallows is performed in the opposite direction to the assembling procedure (point 3.2).



2.5 INSTRUCTIONS OF TRANSPORTING THE GALLOWS BETWEEN WORKPLACES

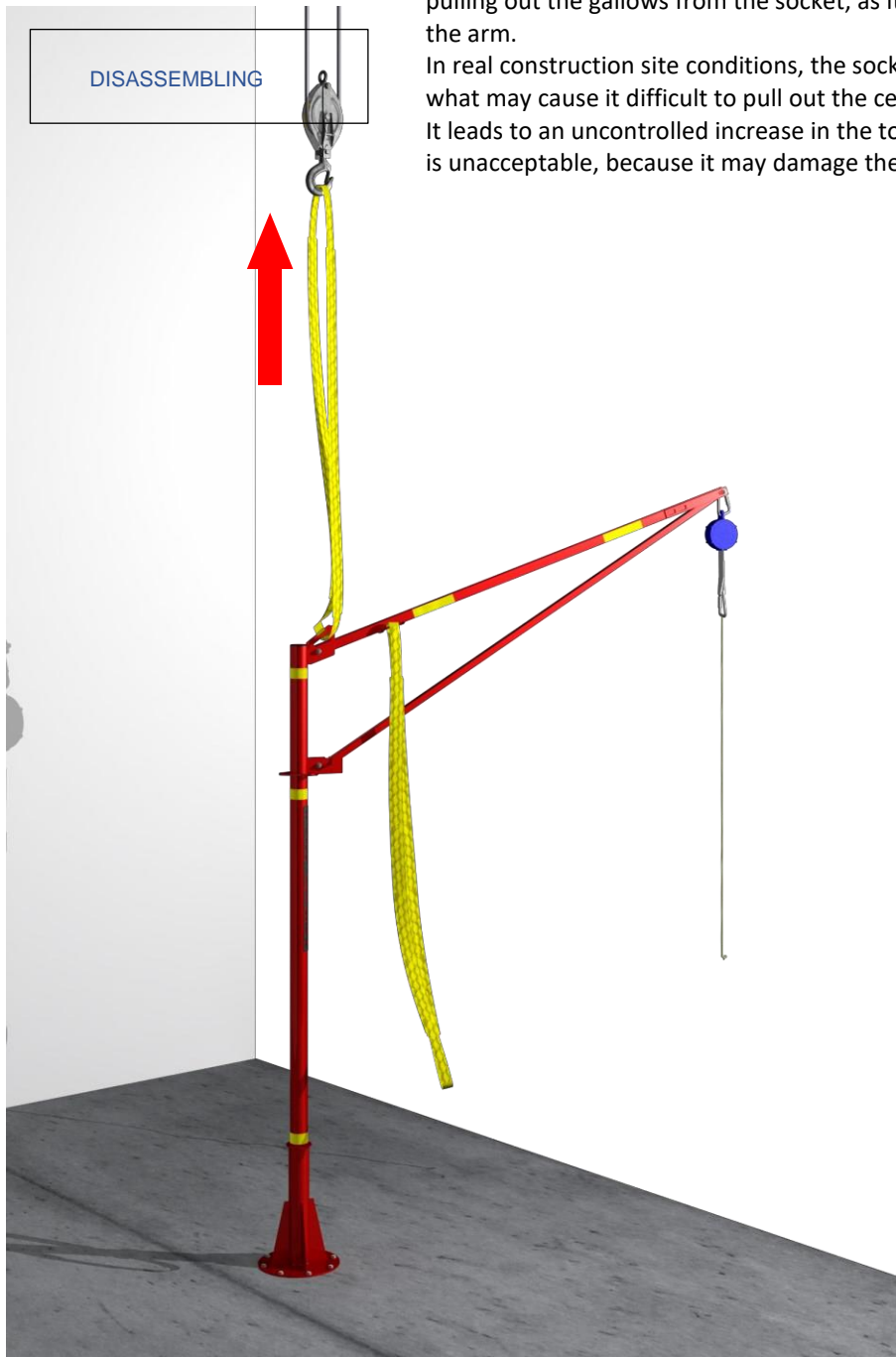
Transporting the gallows between sockets (different workplaces) with a crane demands using appropriate order of slings on a hook.

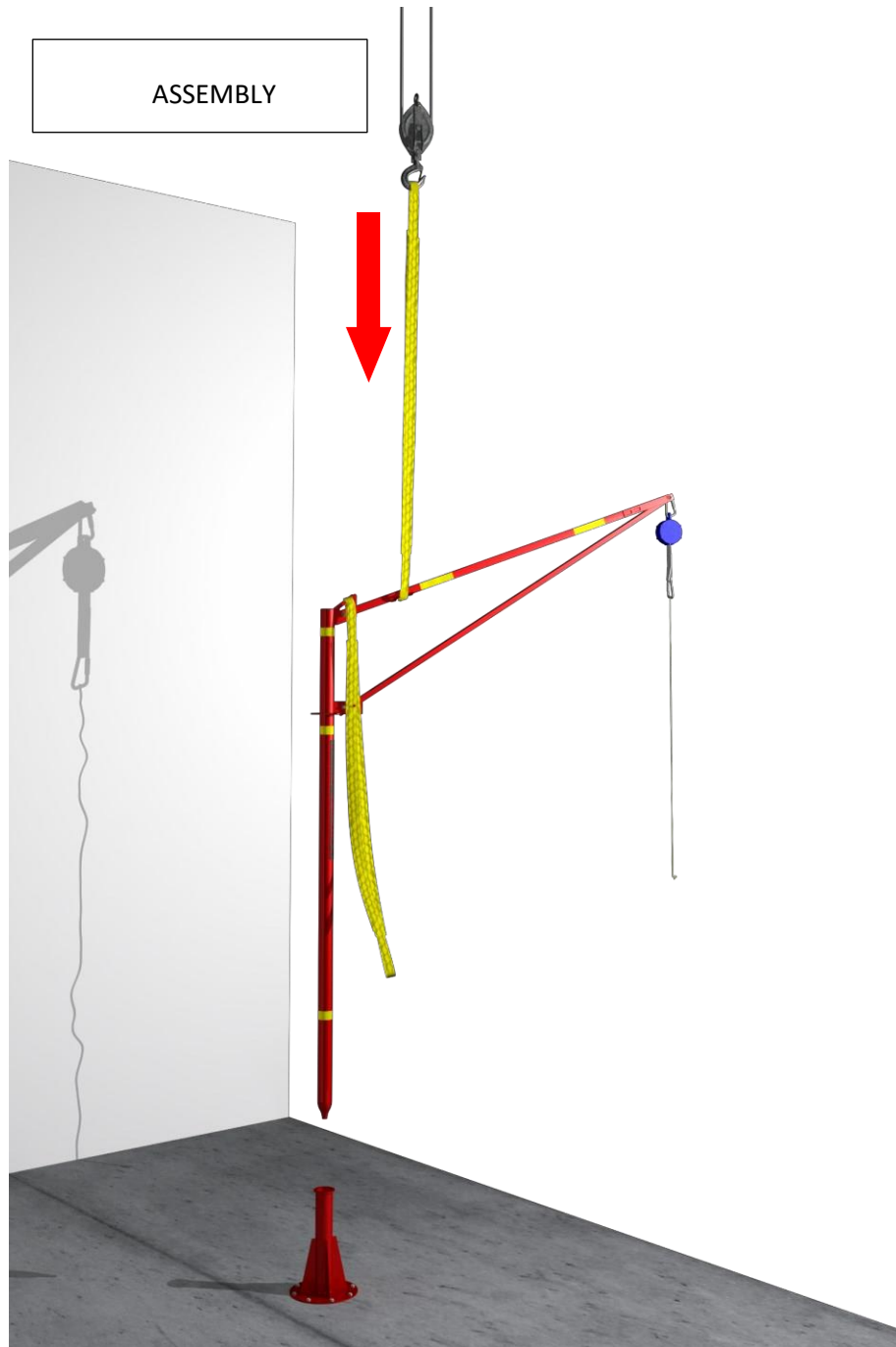
Use the sling placed on the central pole while pulling the gallows out of the bracket.

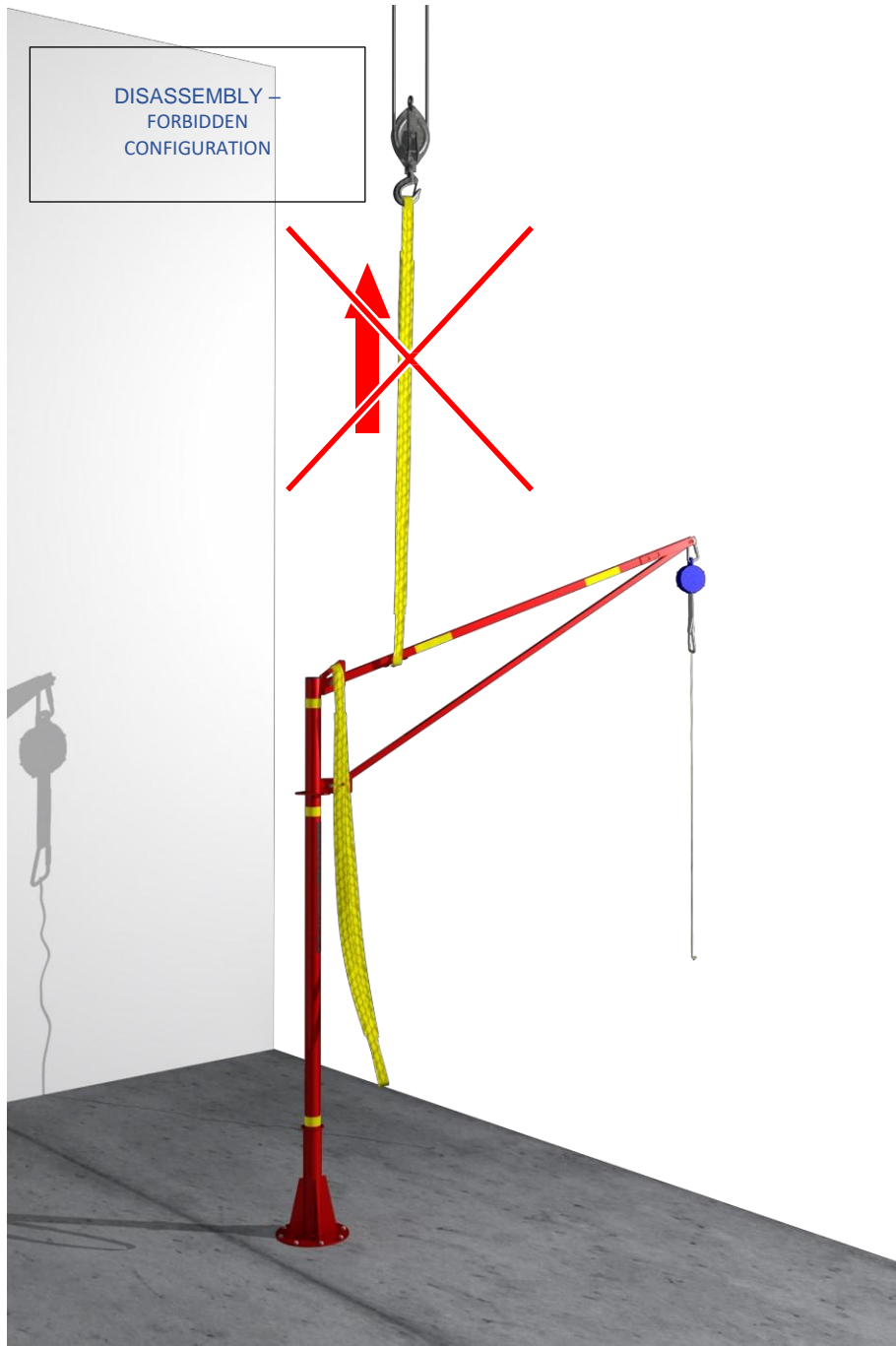
While transporting and assembling the gallows in the socket, use the sling mounted to the top arm.

The sling bracket on the top arm shouldn't be used while pulling out the gallows from the socket, as it may damage the arm.

In real construction site conditions, the socket may be contaminated what may cause it difficult to pull out the central pole of the gallows. It leads to an uncontrolled increase in the top arm burden level and is unacceptable, because it may damage the damping system.



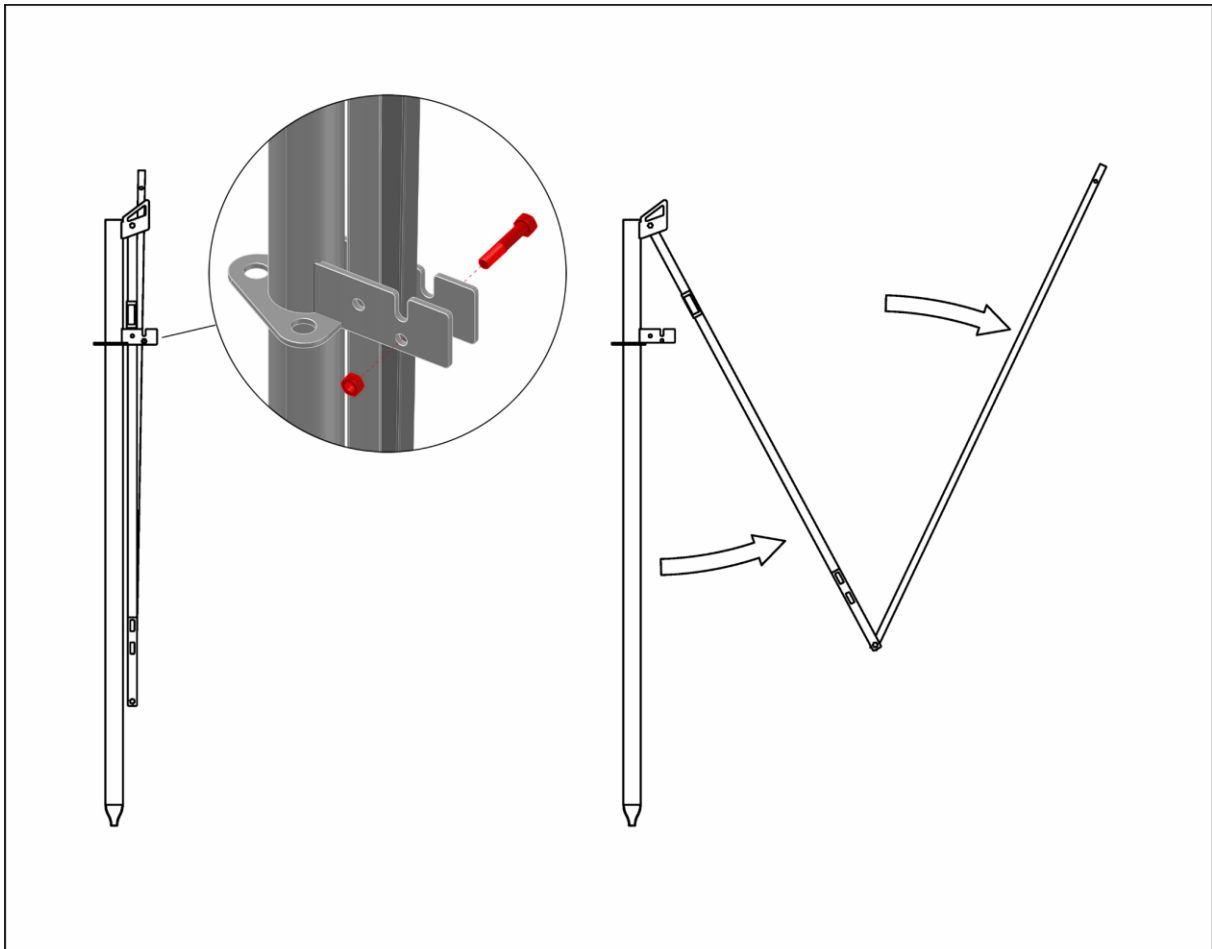




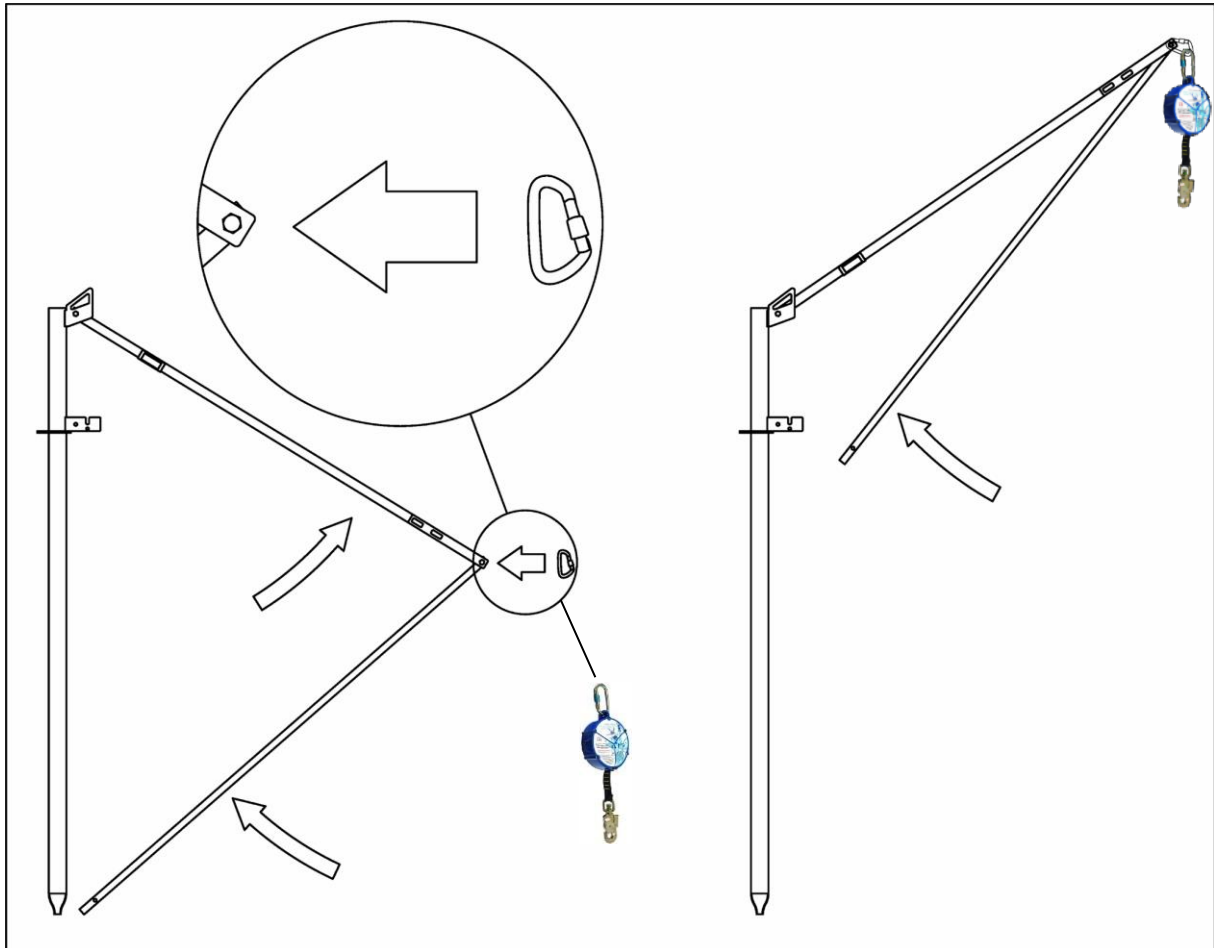
2.6 ASSEMBLY DETAILS

Assembly of the gallows in four easy steps was presented below.

1. Place the device in the socket (see picture no. 3 for the correct assembly version).
Remove the screw securing the bottom bracket and unfold the top and the bottom arm.



2. Twist the arms to reach the proper positions: the BOTTOM ARM makes incomplete 360° twist while the TOP ARM can be twisted upwards by 90°. On this stage, the snap hook of the self-locking device should be assembled (practically, the whole self-locking device is mounted to the anchoring point of the gallows).



3. Place the bottom arm on the bottom bracket socket. The pin placed at the end should slip into the hollow in the bracket.
4. Lock the BOTTOM ARM with a securing screw – removed earlier in point 1 (see p. 15).

