

# Solar systems from Schweizer

## Mounting instructions - PV mounting system

### Flat roof east-west MSP-FR-EW



**Read carefully before use. Keep for consultation.**

All information and illustrations were up to date at the time of publication.

The current version can be downloaded at any time from [www.msp.solar/flachdaecher](http://www.msp.solar/flachdaecher)

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01/2024  
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## 1 About these instructions

### 1.1 Basic notes on the installation instructions

The mounting instructions contain important information on how to install the mounting system safely, properly and in accordance with the regulations. By following the instructions, dangers are avoided and repair costs and downtimes are reduced.

These installation instructions must be kept for reference during the entire installation period of the PV mounting system.

The applicable documents are listed in the appendix **Chapter 10 Additional documents**

### 1.2 Standards and technical directives

The Schweizer MSP-FR-EW mounting system complies with the following standards:

- DIN EN 1990: Eurocode 0: Grundlagen der Tragwerksplanung
- DIN EN 1991-1-1: Eurocode 1: Einwirkungen auf Tragwerke  
Teil 1-1: Allgemeine Einwirkungen auf Tragwerke – Wichten, Eigengewicht und Nutzlasten im Hochbau
- DIN EN 1991-1-3: Eurocode 1: Einwirkungen auf Tragwerke  
Teil 1-3: Schneelasten einschliesslich nationale Anhänge
- DIN EN 1991-1-4: Eurocode 1: Einwirkung auf Tragwerke  
Teil 1-4: Windlasten einschliesslich nationale Anhänge. Die spezifischen Druckkoeffizienten wurden in Windkanaltests ermittelt.
- DIN EN 1999-1-1: Eurocode 9: Bemessung von Aluminiumtragwerken
- DIN EN 18195-1: Bauwerksabdichtungen – Teil 2 – Stoffe

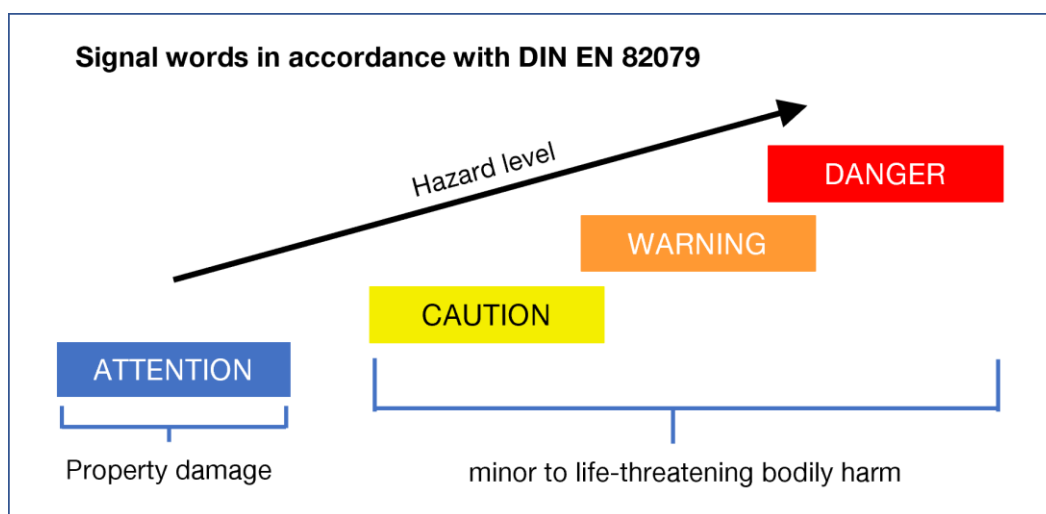
The tests were carried out according to the following directives:

- VDE 0100
- Aerodynamic study according to WTG directives

### 1.3 Structure of the warnings according to hazard levels

#### Differentiation of the hazard levels

The following signal words indicate the different hazard levels by different colour backgrounds:



## 2 Caption to the assembly instructions

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	Attention		Warning of dangerous electrical voltage
	See project report		Audible click
	Correct execution		Direction of movement
	Incorrect execution		Tightening / Tightening torque
Option	Optional step		Earthing / grounding installation

## 3 Copyright

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### 3.1 Legal reservation

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All annexes are integral parts of the installation instructions.

The PV mounting system has been built in accordance with recognised safety regulations. However, improper use may endanger persons or cause damage to property.

### 3.2 Liability

Liability shall be governed by General Terms and Conditions of Ernst Schweizer AG, which are available at <https://ernstschweizer.com/en/agb/>.

## 4 Safety

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### 4.1 Intended use

The Schweizer PV mounting system is designed exclusively for mounting framed photovoltaic modules on buildings with flat roofs with an angle of inclination of no more than 3°. Any other use is (strictly) prohibited by Schweizer and not in accordance with the intended use.

The definition of intended use includes following the information in these installation instructions.

Schweizer cannot be held liable for damage or loss resulting from non-compliance with these installation instructions, in particular the safety instructions, or from misuse of the product.

#### 4.2 Reasonably foreseeable misuse

The designated reasonably foreseeable misapplications do not claim to be exhaustive. If necessary, the list must be extended by documented incidents.

These include:

- Mounting of photovoltaic systems with an angle greater than 3°
- Staying of persons under suspended loads (during assembly)
- Use of fittings and accessories such as screws or connectors during the assembly of the supporting structure that are not originally included in the scope of delivery
- Assembly of the supporting structure by unauthorised technically qualified staff.
- Damage to the roof membrane
- Mounting of the supporting structure on an unstable substructure/roof
- Incorrect positioning of the PV modules
- When setting up the construction site on the roof, storing the installation material on the roof and when leaving the construction site, the construction site material (tools, packaging material, pallets, installation and system material not yet installed, etc.) and unfinished systems must always be adequately secured against the effects of the weather.
- Non-observance of safety devices, safety regulations and current accident prevention regulations

Defects can additionally occur due to the use of non-approved components in case of repair.

#### 4.3 Requirements for safe operation

In order to avoid personal injury and damage to property, care must be taken during all activities in connection with the operation of the PV mounting system in accordance with the regulations. In the event of non-compliance, Ernst Schweizer AG accepts no liability for any damage to property and/or personal injury.

##### Furthermore:

- The PV mounting system may only be operated if it is in perfect working order.
- All warnings and safety instructions in these installation instructions and those of the suppliers must be followed.
- Unauthorised modifications to the PV mounting system are prohibited.

#### 4.4 Responsibility of the customer or the fitter

The customer or the installer is responsible for compliance with the following relevant points:

It must be ensured that:

- all applicable accident prevention regulations and occupational safety regulations (or equivalent regionally applicable standards) are complied with.
  - DGUV Vorschrift 1 – Grundsätze der Prävention (ersetzt BGV A1)
  - DGUV Vorschrift 3 – Elektrische Anlagen und Betriebsmittel (ersetzt BGV A3)
  - DGUV Vorschrift 38 – Bauarbeiten (replaces BGV C22)

- the installation is only carried out by persons who have suitable basic technical and specialist knowledge of mechanics.
- the persons responsible for carrying out the work can assess the tasks assigned to them and recognise possible risks.
- the persons responsible for carrying out the work are familiar with the system components and the installation procedure.
- the project report for the project to be installed has been read and fully understood by the persons responsible for carrying out the work.
- the project report is available at all times during installation. The project report is an essential part of Schweizer's installation system.
- the permissible installation conditions are observed. Schweizer cannot be held liable for any damage or loss resulting from non-compliance with these conditions.
- the correct assembly in accordance with the project report and the provision of any necessary tools is ensured.
- if necessary, a suitable lifting device is used for the assembly.
- components with visible damage are not used and replaced.
- each component and its accessories are used exclusively as intended and specified in the project report.
- only Schweizer MSP-FR-EW or other specified MSP Schweizer components are used for assembly, even if parts have to be replaced. Otherwise, no warranty claims will be accepted.
- the roof membrane is not damaged in any way by parts of the mounting system falling down, being dragged on it or penetrating it.
- regular maintenance must be carried out once a year, including an inspection of the bolted connections, the mechanical connections, the position of the protective layers, the wiring, the earthing and the condition of the roof membrane.
- the roof on which the system is mounted is designed and constructed to suit and safely withstand the system. This includes, but is not limited to, the structural strength of the roof, the condition and compatibility of the roof membrane, the required long-term load-bearing capacity of the insulation material, and the appropriate drainage of water from the roof surface. Schweizer cannot be held responsible for damage to roofs where the design or construction of the roof is not suitable to accommodate the system installation.
- the Schweizer MSP-FR-EW system can be incorporated into and connected to the design of the electrical equipotential bonding system by properly attaching a suitable earthing clamp or screw (not supplied by Schweizer). The customer must ensure compliance with current rules, legal regulations and guidelines.
- installation is carried out in accordance with current national regulations and guidelines, including, among others, compliance with the required edge distance to the roof, the installation of safety barriers, restricted access during operation, or precautions for expected dynamic loads or special events such as earthquakes and extreme weather conditions.
- if the installation is attached to the building in any way, that attachment is to be adequately designed and provided.
- the existing lightning protection system of the building, if any, must be adapted in accordance with the current technical rules and legal regulations. If necessary, observe the "Leaflet - Lightning current carrying capacity for PV mounting system MSP-FR".

- For this purpose, the following standards (or corresponding regionally valid standards) must be observed for the design and installation of lightning protection, earthing, equipotential bonding:
  - DIN EN 62305 Blitzschutz
  - DIN VDE 0185 Teil 1-4 Blitzschutz
  - DIN VDE 0100 Teil 410 Erdung
  - DIN VDE 0105 Betrieb von elektrischen Anlagen
  - DIN VDE 0298 Elektrische Leitungen

Furthermore:

- „The rules and regulations of the “Zentralverbands des Deutschen Dachdeckerhandwerks (ZVDH)“ or equivalent regionally valid standards for work on roofs must be observed.
  - DIN 18338 Dachdeckungsarbeiten
  - DIN 18451 Gerüstarbeiten

as well as:

- Die Richtlinien zur Schadenverhütung VDS 2023 – Elektrische Anlagen in baulichen Anlagen mit vorwiegend brennbaren Baustoffen und DIN 4102 – Brandverhalten von Baustoffen und Bauteilen (or equivalent regionally valid standards) must be observed.

### 4.5 Basic safety instructions

The following basic safety instructions and warnings are an integral part of this manual and are essential when handling this product:

- Work clothing must be worn in accordance with national regulations.
- Work safety regulations must be observed.
- Ensure that all electrical work is carried out by qualified electricians. All relevant regulations and directives must be observed.
- The presence of a second person who can provide assistance in the event of an accident is mandatory during all installation work.
- A copy of these installation instructions must be kept in the immediate vicinity of the system for use by the persons who are responsible for carrying out the work.
- Until the PV system is fully completed and ready for operation, all incomplete sections, components and materials must be secured in accordance with the applicable regulations.

## 5 Residual hazards

These following safety instructions must be followed to avoid danger to people and damage to the PV mounting system and the PV modules.

### DANGER



#### Electric shock due to lightning striking the PV mounting system

The support structure with the mounted photovoltaic systems is operated outdoors. In the event of a lightning strike, life-threatening injuries may result.

Properly earth the PV mounting system.

Do not carry out any maintenance or servicing work on the PV mounting system during a thunderstorm.

### DANGER



#### Electrical voltage due to loosened protective conductors or earthing connections

If protective conductors or earth connections have been loosened, conductive parts including handles, covers and locks, which appear to be insulated, can cause an electric shock if touched. Check that all protective conductors and earth connections are connected.

In case of current leakage from defective components or cables, leave the danger zone immediately.

### WARNING

#### Danger of falling

Carelessness and tripping can cause a fall when working at height. Life-threatening injuries can result.

- Access to the roof must be secured by the operator so that no unauthorised persons can enter the roof area.
- During cleaning and maintenance work, provide suitable anchoring devices and a body-holding device.

### CAUTION

#### Risk of tripping and falling

Objects lying around or cable ducts attached to the floor may cause a risk of tripping and falling, resulting in injuries.

- Avoid obstacles in the field of movement.
- Lay cable ducts so that no obstacles are created.
- Do not store/place any objects in the danger zone.



## 6 Technical clarification before installation

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The suitability of the roof for supporting a PV system must be checked and confirmed by the customer (structural engineer / specialist planner) within the framework of the recognised rules, technology, legal requirements, standards and specialist rules:

The following points, among others, are to be emphasised here:

- Sufficient structural load-bearing capacity for the additional loads of the PV system
- Checking the load-bearing capacity of the insulation material with regard to the permissible bearing pressure
- Suitability and condition of the roof membrane
- Checking the roof drainage with regard to inadmissible water accumulation
- Condition of the roof (free of any damage)

## 7 Roof preparation

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Before starting the installation of the PV system, the roof must be thoroughly cleaned, removing all dirt and debris, as well as snow and ice. The installer must ensure that the installation conditions required for MSP-FR-EW are fulfilled and that persons entrusted with the installation work are professionally trained and fully familiar with the installation system.

### NOTE



The material is to be distributed on the roof in such a way that no excessive point loads occur.

## 8 Commissioning and maintenance

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Installation and commissioning may only be carried out by authorised personnel.

Observe the safety instructions listed here as well as the instructions at the beginning of these operating instructions, **Chapter 4 Safety**.

Carry out regular maintenance once a year, including an inspection of the bolted connections, the mechanical connections, the position of the protective layers, the wiring, the earthing and the condition of the roof membrane.

## 9 Installation conditions

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The Schweizer MSP-FR-EW mounting system is designed for the following conditions:

- The installation of the system must be carried out in a correct way according to the project and its local conditions, especially with the necessary calculation of additional loads.
- For mounting framed photovoltaic modules with a frame height of 28-45 mm or 28-40 mm when using the additional clamps Fehler! Verweisquelle konnte nicht gefunden werden..
- On flat roofs with an inclination of no more than 3°.
- For module sizes according to data sheet MSP-FR-EW.
- A maximum block size of 14 m x 14 m is permissible to avoid unnecessary stresses on the roof cladding due to thermal expansion.
- The minimum permissible coefficient of friction between the protective layer and the roof membrane is 0.3.
- Suitable for environmental conditions within the range of normal corrosive environments (e.g. at least 1 km from sea coasts), and in more corrosive environments (e.g. C4) if regular maintenance is ensured.
- For all membrane roof coverings, including bitumen, as well as concrete roof surfaces. However, Schweizer is not responsible for ensuring the continuation of the validity of the warranty granted by the manufacturer of the roof covering.
- When mounting on roofs with gravel fill, the "Leaflet - PV mounting system MSP-FR on gravel roofs" must be observed.
- For modules that permit the use of clamps on the short edges in the corners (Schweizer can provide a list of permitted modules on request). Schweizer is not responsible for ensuring the continuation of the validity of the warranty granted by the module manufacturer. However, Schweizer will support the customer as far as possible and expedient in obtaining all necessary clamping permits from the module manufacturers.
- For roofs that sufficiently withstand the additional load from the PV system (as assessed by the customer and within his responsibility). The calculated total load applied to the roof by the MSP-FR-EW system includes the MSP mounting system, the modules (as specified in the project report) and the required ballast. All other loads are excluded (e.g. cables, inverters, etc.).

10 Additional documents

Document type	Naming	File
Mounting instructions	Solar systems of Schweizer: Mounting instructions – MSP-FR-EW flat roof PV mounting system	<a href="https://ernstschweizer.com/wp-content/uploads/sites/2/2023/07/MSP-FR_PV_installation-system_20230707.pdf">https://ernstschweizer.com/wp-content/uploads/sites/2/2023/07/MSP-FR_PV_installation-system_20230707.pdf</a>
Leaflets	Information sheet – lightning current carrying capacity with the flat roof system MSP-FR	<a href="https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/Information_sheet_lightning_current_carrying_capacity_MSP-FR.pdf">https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/Information_sheet_lightning_current_carrying_capacity_MSP-FR.pdf</a>
Leaflets	Information leaflet – Installation safety with PV mounting system MSP-FR	<a href="https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/MB_Hoehensicherung_MSP-FR_EN.pdf">https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/MB_Hoehensicherung_MSP-FR_EN.pdf</a>
Leaflets	Fact sheet on loads reductions – MSP-FR-EW and MSP-FR-S.	<a href="https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/Hinweise_zu_Lastabminderung_MSP-FR_EN.pdf">https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/Hinweise_zu_Lastabminderung_MSP-FR_EN.pdf</a>
Leaflets	Information sheet – MSP-FR photovoltaic mounting system on gravel roofs	<a href="https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/MB_MSP-FR_auf_Kiesdaecher_EN.pdf">https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/MB_MSP-FR_auf_Kiesdaecher_EN.pdf</a>
Leaflets	Instructions - Grounding with the flat roof system MSP-FR	<a href="https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/MB_Potentialausgleich-durch-leitende-Mittelklemme_en.pdf">https://ernstschweizer.com/wp-content/uploads/sites/2/2023/04/MB_Potentialausgleich-durch-leitende-Mittelklemme_en.pdf</a>

11 Required tools



Cordless screwdriver



**If the cordless screwdriver is equipped with a percussion drilling function, it must be switched off.**



T 30

Torx- adapter TX30




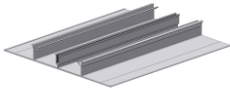

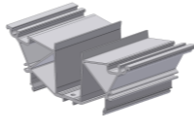


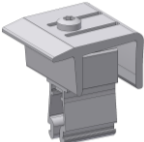
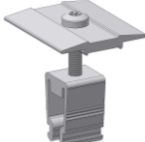
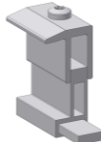
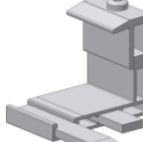




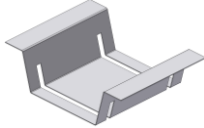
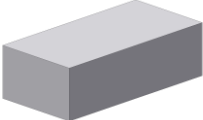
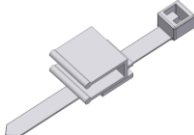





Torque spanner (10 Nm) for/with Torx-adapter TX30

**Assembly instructions Stainless steel screw connections:**

The assembly must be carried out professionally. To avoid cold welding between the screw and the nut, use a screwdriver

- use a screwdriver without impact drilling function
- set an appropriate, not too high speed
- do not apply increased pressure to the screw

12 Components

				
<p><b>Protection sheet</b> MSP-FR-EW PSF</p>	<p><b>Base profile</b> MSP-FR-EW-BP -150, - 300, - 450, - 600, - 900, -1200</p>	<p><b>Support high</b> MSP-FR-EW-SH</p>	<p><b>Support low</b> MSP-FR-EW-SL 8 MSP-FR-EW-SL 10</p>	<p><b>Adapter support</b> MSP-FR-G-AS</p>
				
<p><b>Connection rail</b> MSP-FR-EW-C</p>	<p><b>End clamp</b> MSP-PR-EC MSP-PR-ECB</p>	<p><b>Middle clamp</b> MSP-PR-MC MSP-PR-MCG MSP-PR-MCB MSP-PR-MCBG</p>	<p><b>Additional clamp high</b> MSP-FR-HC</p>	<p><b>Additional clamp low</b> MSP-FR-LC</p>
				
<p><b>Screw</b> MSP-FR-S M6x16</p>	<p><b>Screw</b> MSP-FR-TS 6.3x22 Lightning current screw</p>	<p><b>Grounding screw</b> MSP-FR-GS 6x60</p>	<p><b>Wind deflector / Ballast tray</b> MSP-FR-S-WD</p>	<p><b>Ballast tray holder</b> MSP-FR-S-SB</p>
				
<p><b>Ballast stone</b>  Not included in the scope of delivery</p>	<p><b>Cable holder with edge clip</b> MSP-FR-CHE</p>	<p><b>Fixing Clamp</b> MSP-FR-BC</p>	<p><b>Ballast carrier starter plate</b> MSP-FR-EW-BS</p>	<p><b>Ballast carrier New</b> MSP-FR-BT</p>
				
<p><b>S.P.T</b> Project report</p>				

# Solar systems from Schweizer

## Mounting instructions - PV mounting system

### Flat roof east-west MSP-FR-EW

#### 13 Preparation

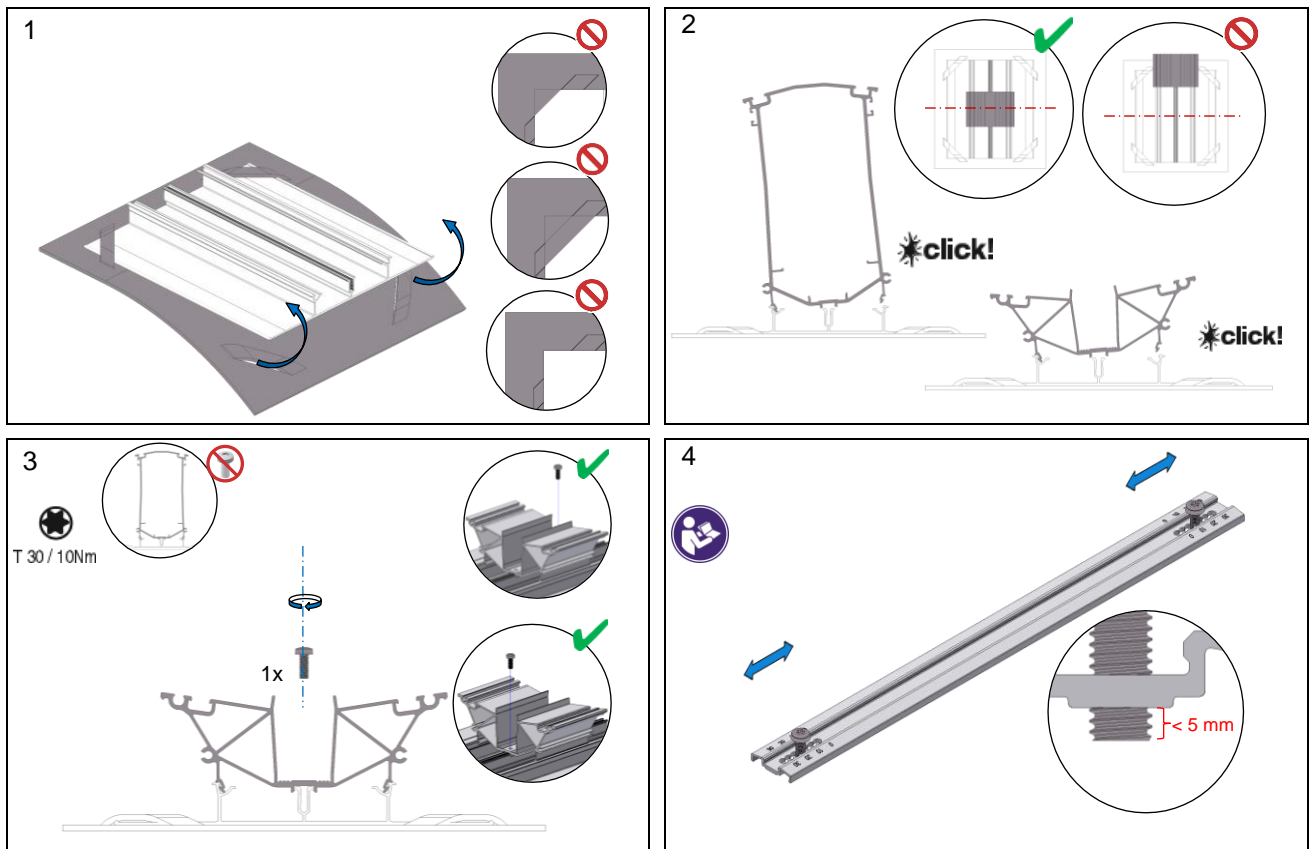
Prior to construction:

- The S.P.T project report must be available
- The material must be complete

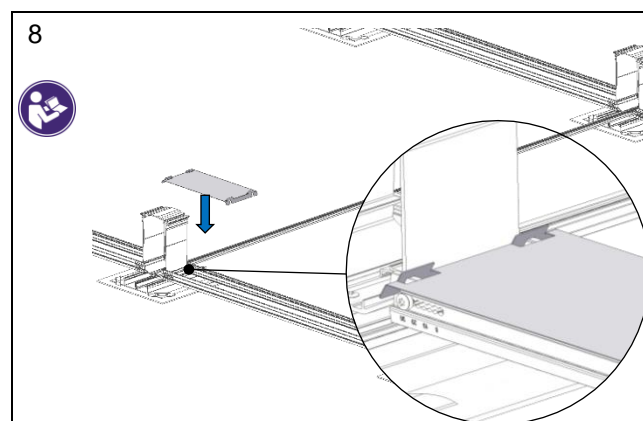
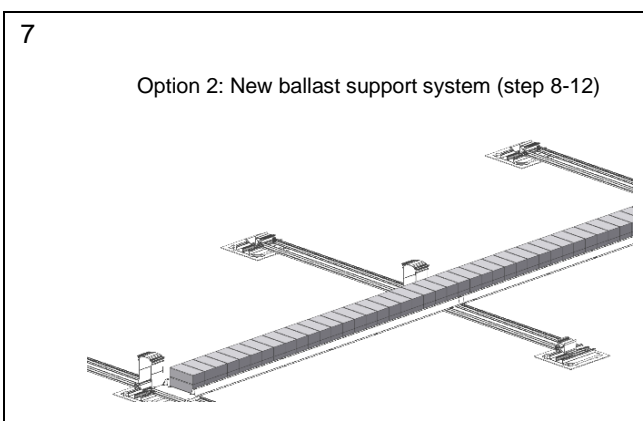
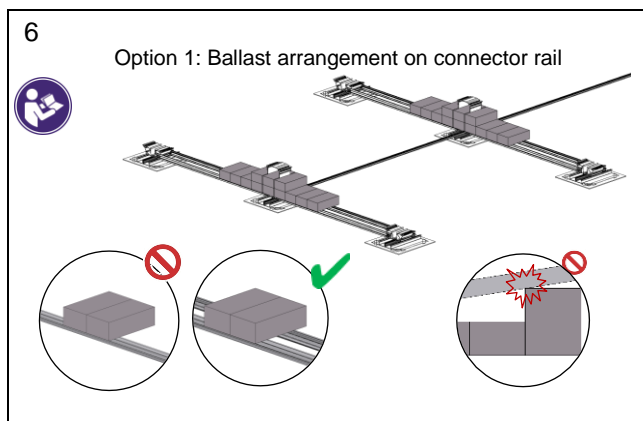
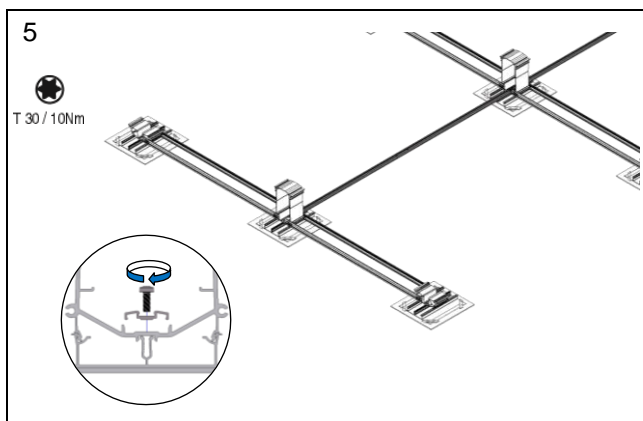
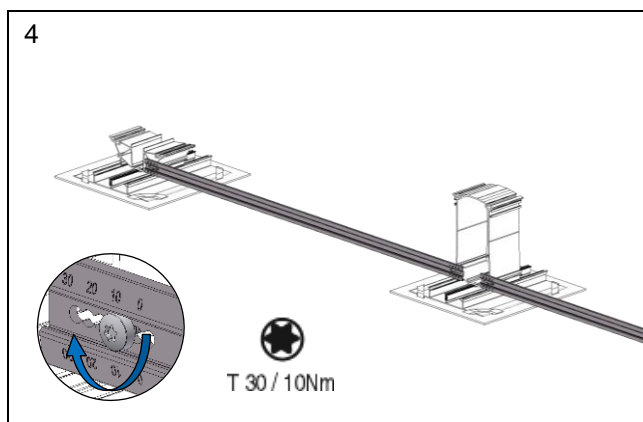
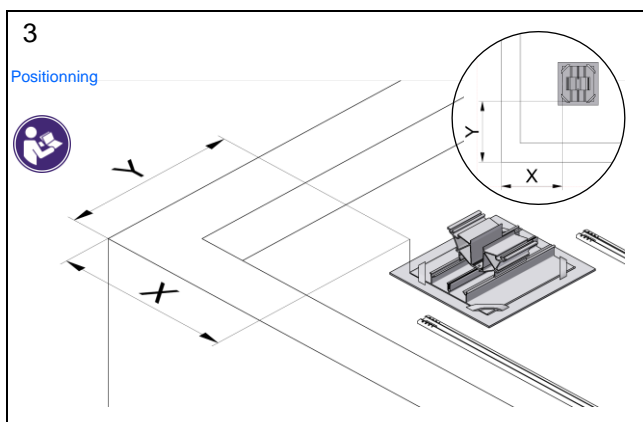
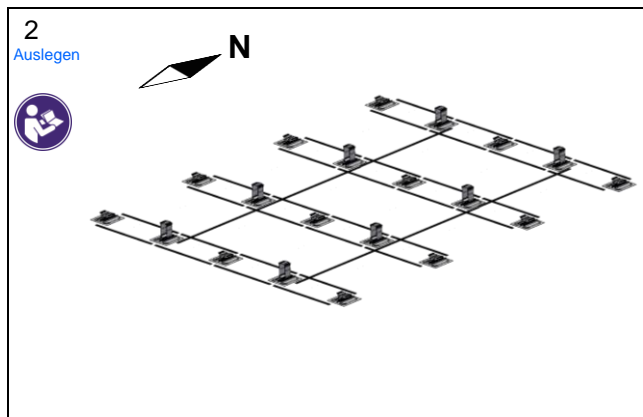
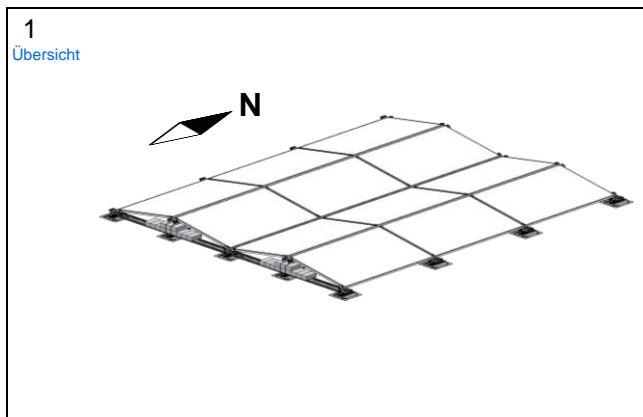
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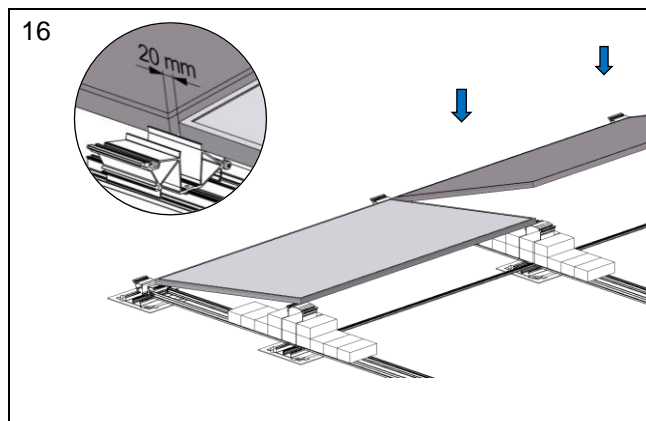
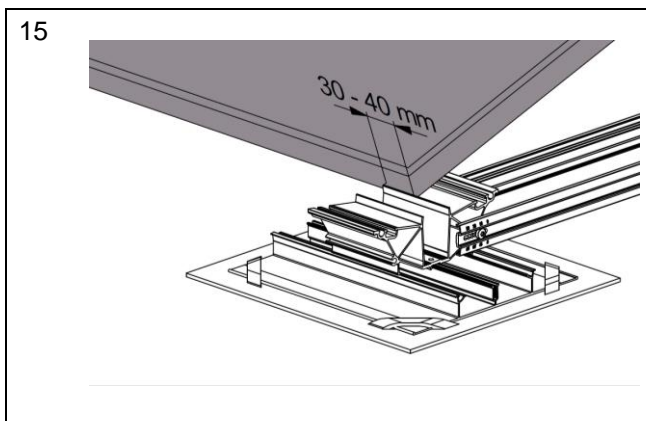
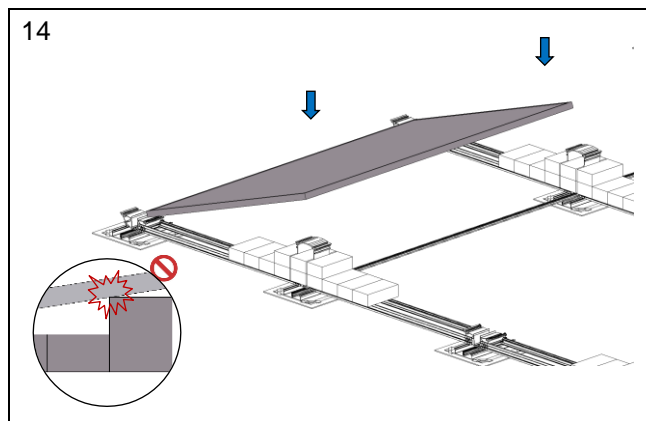
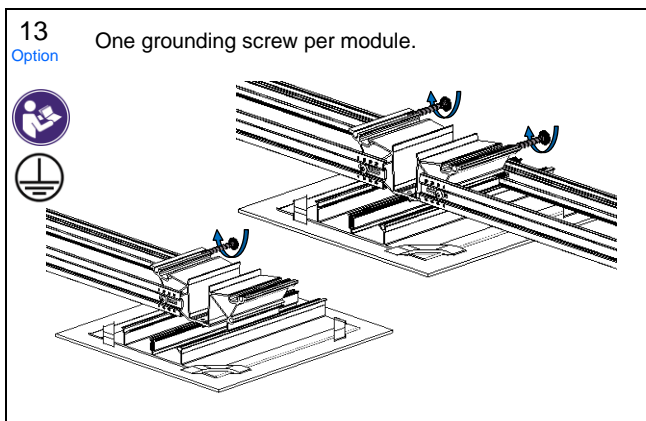
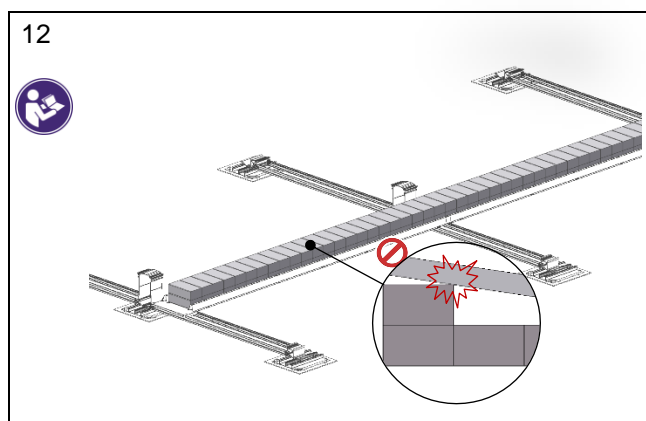
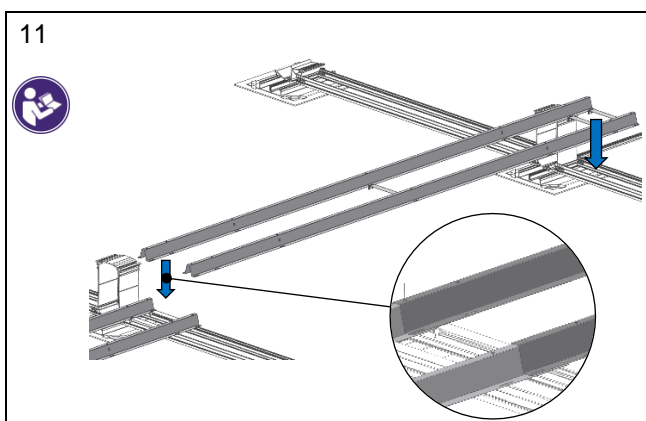
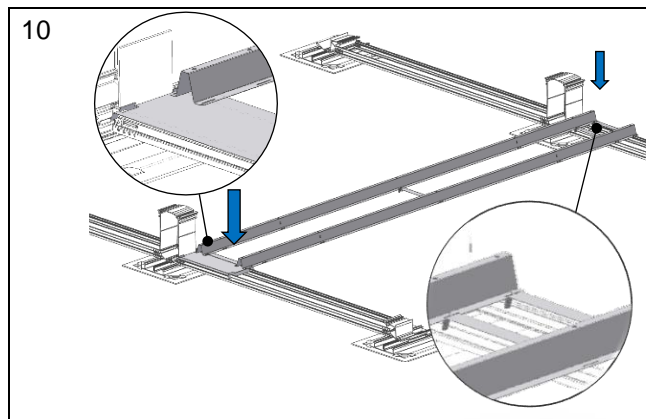
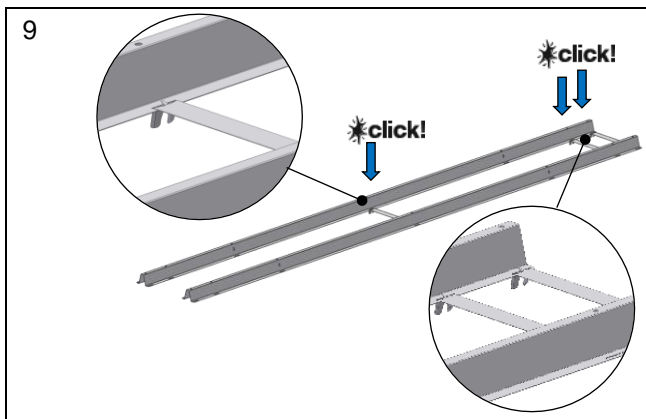
- **Centre support** – Appendix 1 - page 17
- **Additional clamp** – Appendix 2 – page 18
- **Green roof** – Appendix 3 - page 20
- **Former ballast tray system** - Appendix 4 – page 21

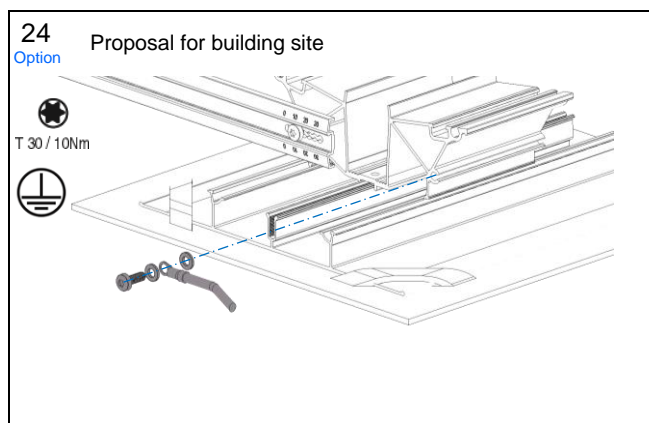
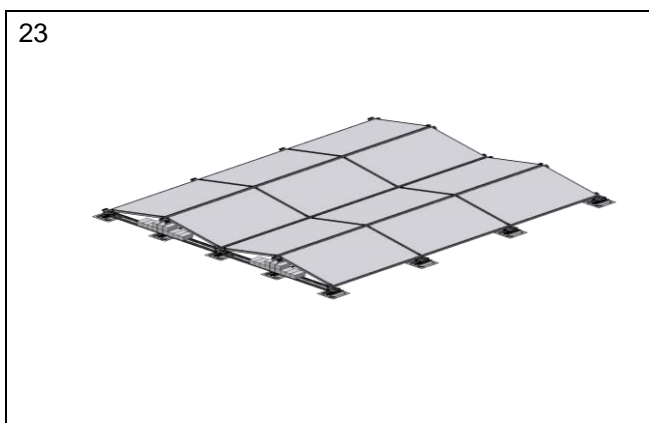
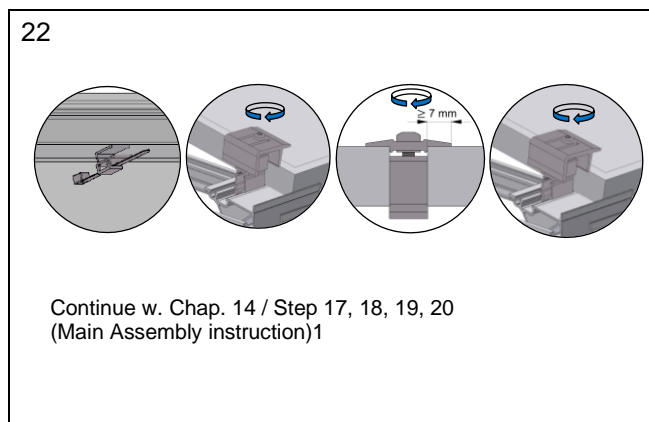
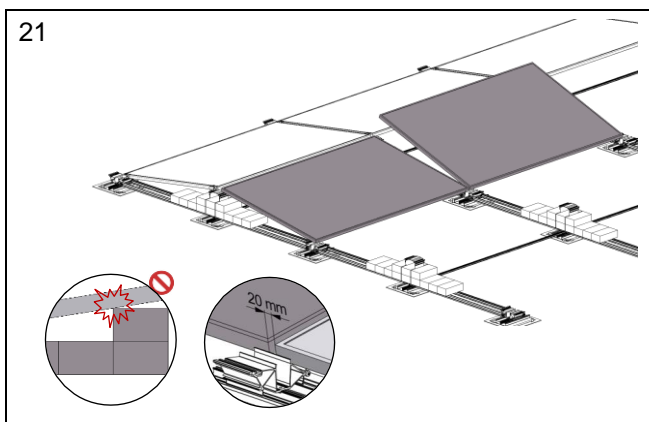
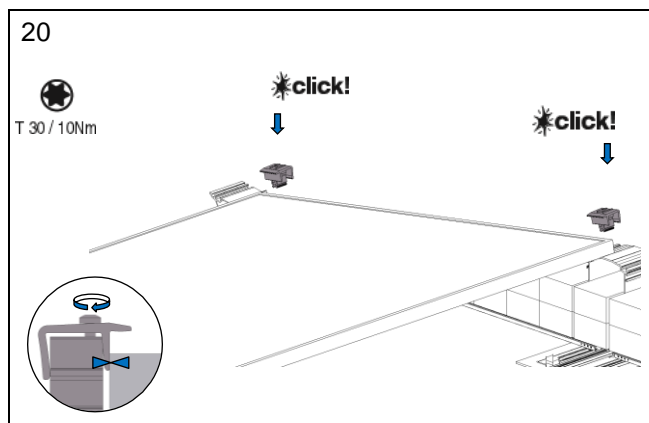
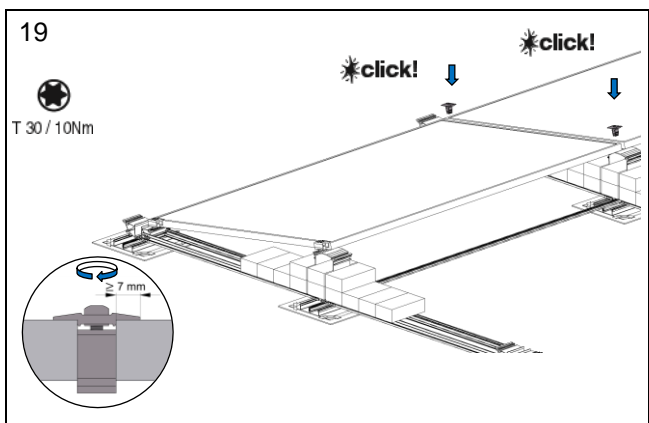
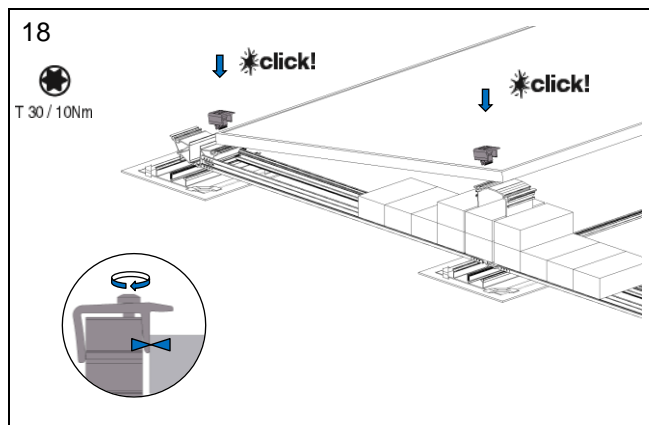
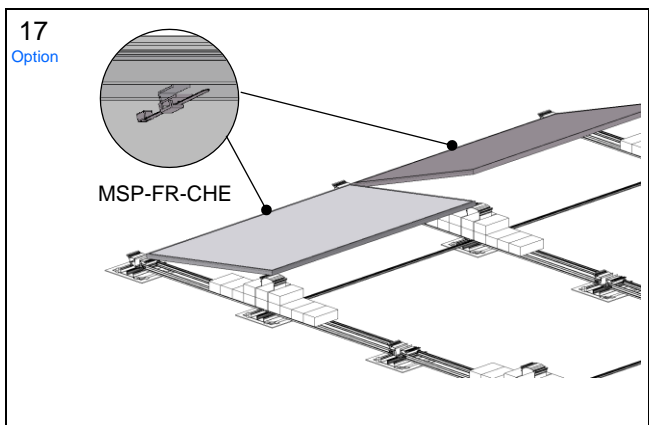
Steps 1 to 4 can also be carried out off-site in advance.



14 Assembly

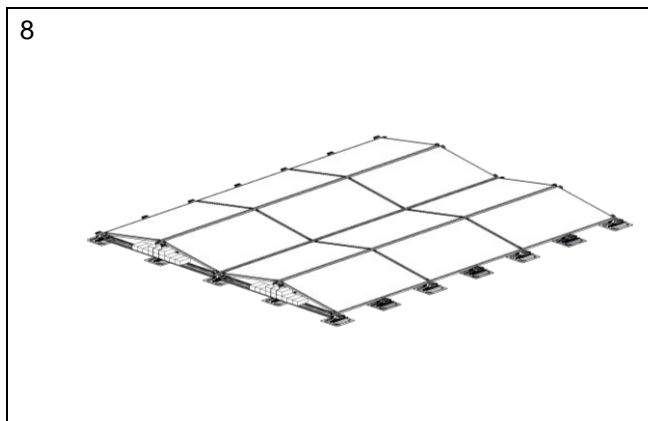
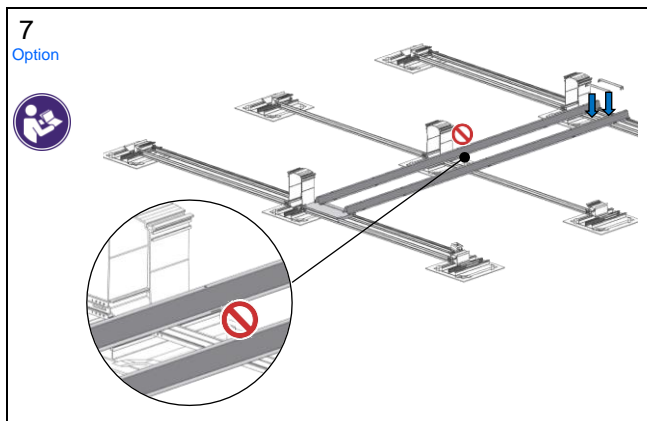
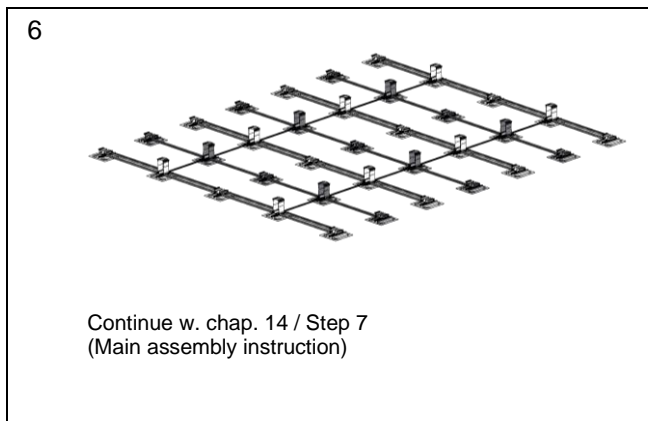
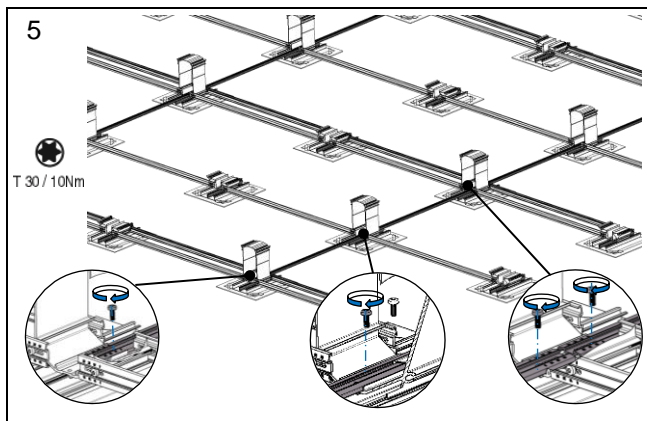
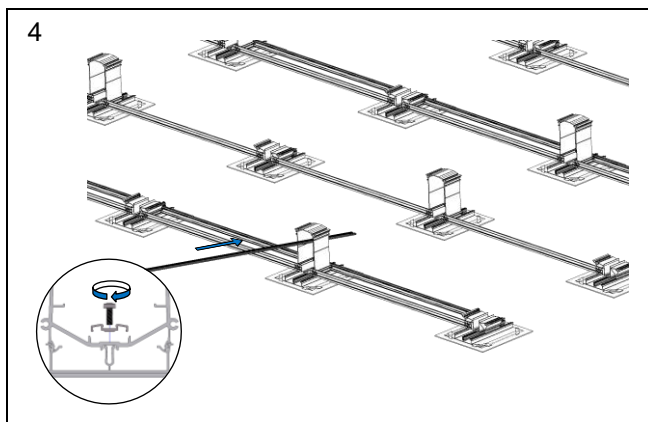
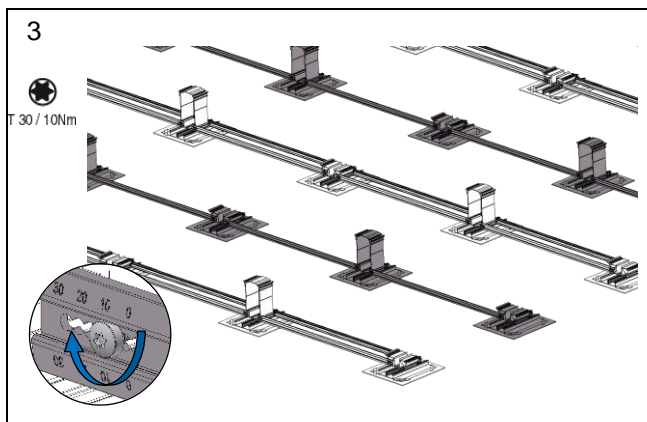
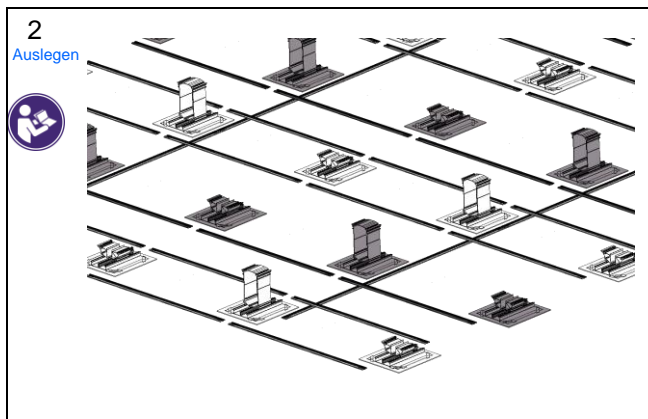
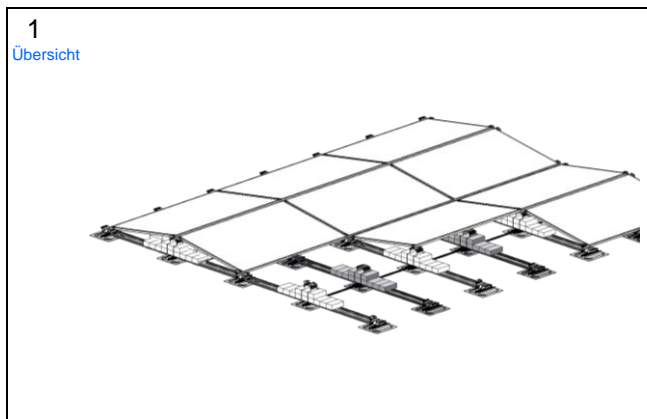




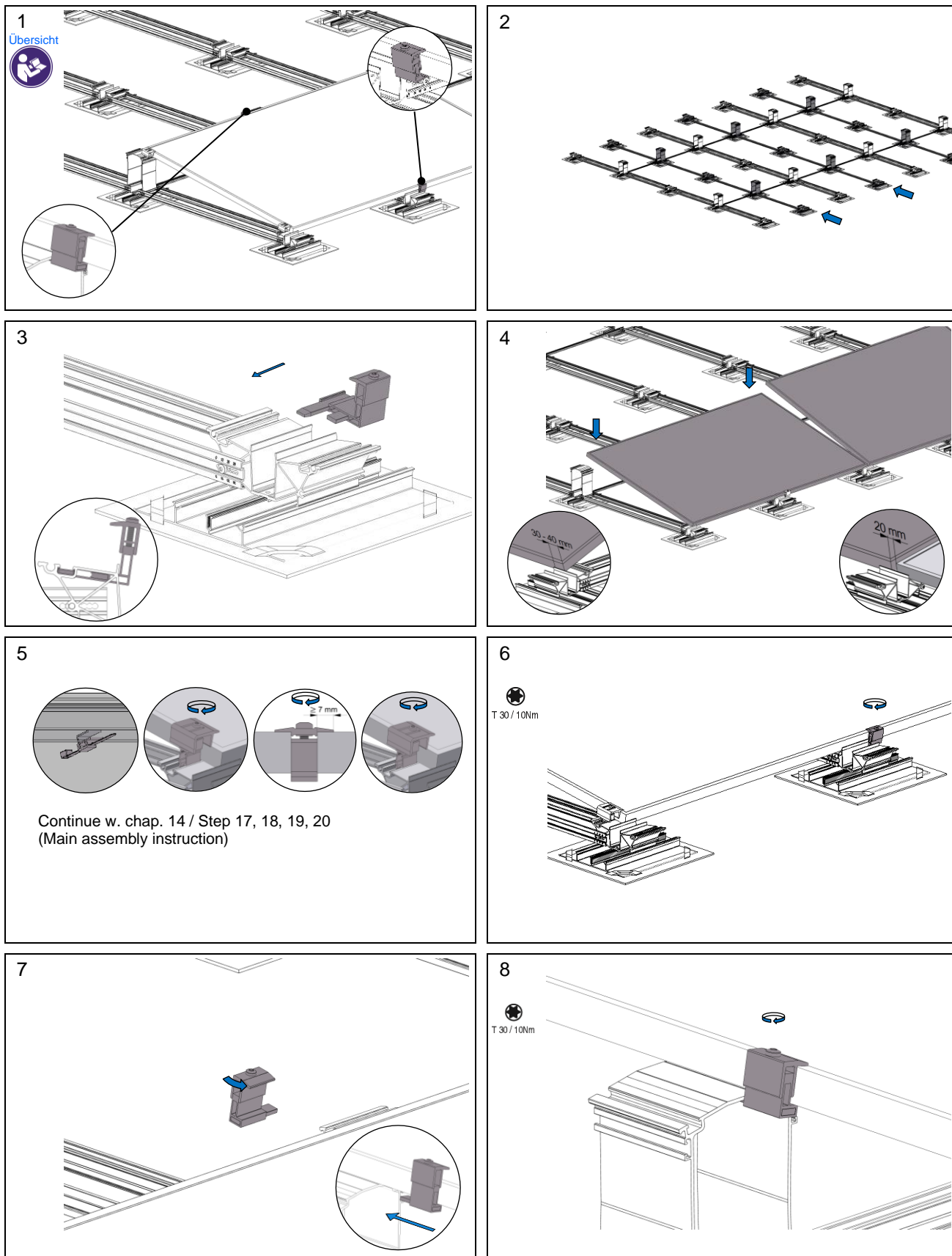


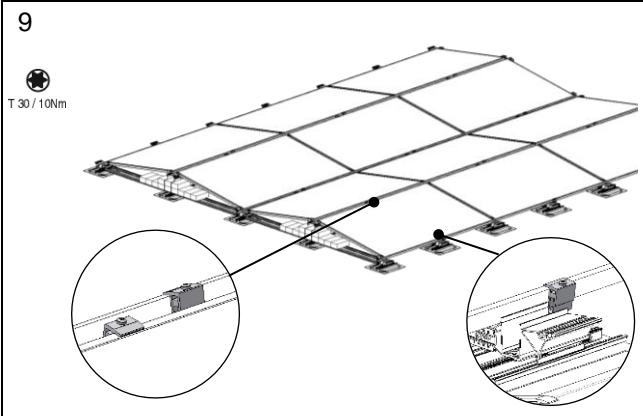


15 Appendix 1 – Centre Support

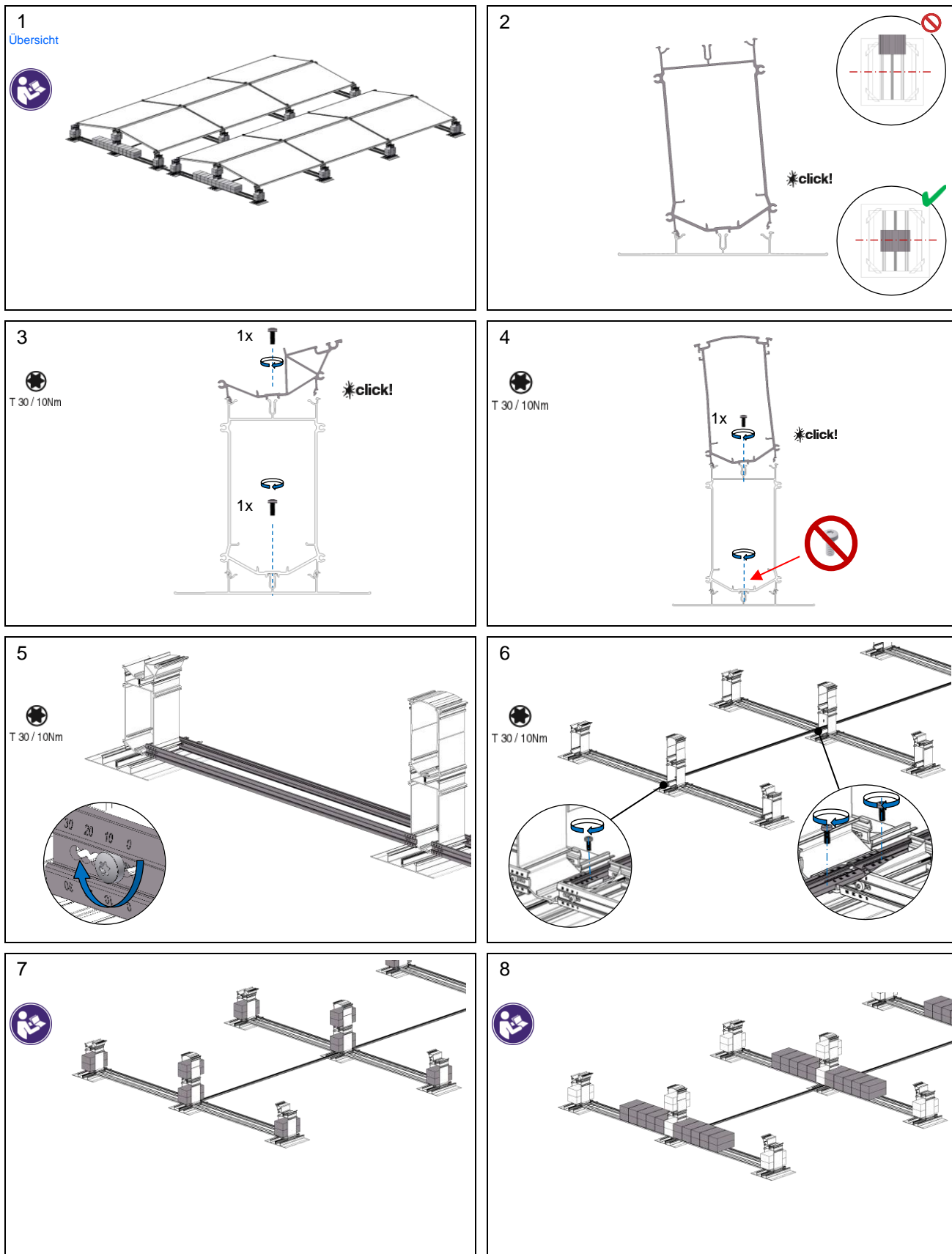


16 Appendix 2 – Additional Middle clamp






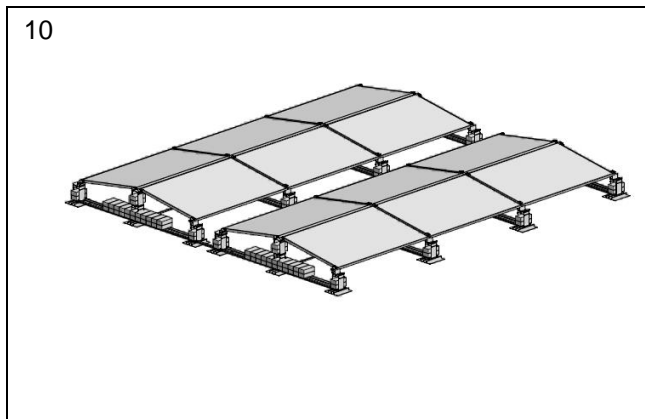
17 Appendix 3 – Green roof installation



9




Continue w. chap. 14 / Step 13  
(main assembly instruction)




18 Appendix 4 – former ballast tray system

1



2

3



4  
Option

