华创天晟
CNTSUN

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DOUBLE PILING SOLAR MOUNTING SYSTEM

INSTALLATION MANUAL

SKYLAND
FIXED MOUNTING SYSTEM

CONTENTS

Ⅰ、GENERAL

Reading Instruction:

This installation manual, created by Wuhan CNTSUN New Energy Technology Co., Ltd. (hereinafter referred to as 'CNTSUN'), guides on the installation and safety usage of the fixed solar mounting systems (hereinafter referred to as the "solar mounting").

All safety precautions and local regulations in this guide must be strictly followed during installation and maintenance;

The assembling team members must be qualified professionals. Please read this installation manual carefully before proceeding with the installation.

CNTSUN has manufactured solar mounting systems with various models and specifications.This guide involves multiple drawings for the same area, and a specified solar mounting drawing must be applied in specific case.Please keep this manual properly for future reference when maintaining or installing the mount. Should you have any questions, please contact CNTSUN at 027-8695-1865. The document content may be updated periodically for version upgrades or other reasons. Unless otherwise agreed, the document serves as a guide only. All statements, information, and recommendations in this document do not constitute express or implied warranties.

1.1 Introduction

Thanks for choosing CNTSUN

To ensure a smooth and efficient installation that complies with all relevant standards and specifications, please read the installation carefully before beginning.

1.2 References

《Design Code for Photovoltaic Power Stations》(GB 50797-2012)

《Photovoltaic Support Structural Design Regulations》（NB/T 10115-2018）

《Construction Specifications for Photovoltaic Power Stations 》(GB 50794-2012)

《Basic Technical Specifications for Solar Power Station Supports》（GB 51101-2016）

《General Technical Requirements for Solar Photovoltaic System Supports》（JG／T 490-2016）

《Photovoltaic power generation engineering components and brackets installation quality assessment standards》（NB/T 10320-2019）

《Code for Acceptance of Construction Quality of Steel Structure Engineering》(GB 50205-2020)

《Code for Construction Quality Acceptance of Building Foundation Engineering》（GB 50202-2018）

《Technical Specifications for Building Pile Foundations 》（JGJ94-2008）

II 、SAFETY

The following signs may appear in this guide, representing the following meanings:

SIGNS	EXPLAINATION
 WARNING!	Planning, mounting and start-up of the solar plant must be performed by qualified personnel only. Poor quality execution can result in damage to the plant and to the building and can present a risk to people.
 WARNING!	Always use the supplied parts to attach the solar modules and mounts. Use of other parts is dangerous and may cause the solar modules or mounts to loosen or fall.
 DANGER!	Do not install during severe or sub-zero weather conditions.
 WARNING!	Risk of breakage! PV modules can be damaged if stepped upon.
 WARNING!	Risk of electric shock! The mounting and maintenance of the PV modules must be carried out by qualified personnel only.Please observe the all safety regulations issued by the manufacturer!

2.1 Personnel Requirements

1、Operators must hold installation operation qualification certificates accordingly such as electrician, welder, high-altitude operation certificates, etc.

2、Operators must be acquainted with the installation process and technical requirements of solar mounting systems. A solid knowledge of mechanical installation and electrical engineering is also required. Master the correct usage of tools to ensure all electrical equipment is intact during the process.

3、Operators must have good physical endurance and balance to accommodate long-term outdoor work and various installation environments

4、Operators have to be experienced in solar mounting system with different types and specifications and be skilled in site team cooperation.

2.2 General Safety

1、Adhered to safety regulations, personnel must be equipped with a complete set of protective equipment and be cautious of potential safety risks such as falling, hitting, or electric shock.

2、In compliance with high altitude operation regulations, climbing equipment such as scaffolding, lifting platforms, etc must be available and qualified.

3、Ensure a suitable on-site environment, a solid foundation must be guaranteed and warning signs for obstacles, and potholes must be highlighted.

4、Equipment and tool safety: To ensure safety and reliability, the tools and equipment used for installation need to be regularly inspected and maintained; Large equipment such as cranes and hoists should be operated correctly under the guidance of professionals.

5、Comprehensive emergency plans should be developed for personnel injuries and unexpected situations response.

2.3 Electric Shock Risk

1、All work is carried out under safe operating conditions, including compliance with temporary electricity using code. Special live work requires an electrician's license.

2、Make sure to turn off the power supply in the construction area before installation. Hang a sign that says "Do Not Turn On - Work in Progress". Also, a dedicated person should be arranged to guard against accidental activation of the power switch.

3、On-site electrical equipment must be inspected strictly to ensure its good performance including good insulation, no leakage, and reliable grounding.

4、It is strictly prohibited to install or repair equipment while it is powered on.

5、The installer should complete professional electrical safety training and be well-versed in first aid for electric shocks and emergency response procedures.

6、Outdoor installation work should be immediately halted during thunderstorms, and workers should stay away from mounting systems and tall metal objects.

2.4 Mechanical Risk

1、Use lifting equipment, such as cranes, forklifts, and hoists, which is appropriate for the workload and site conditions. Operators of these equipment should be professionally trained and certified.

2、Operators must be familiar with equipment usage and safety regulations; To ensure a secure installation, operators must wear appropriate protective goggles to prevent splashing injuries to the eyes; Guarantee secure mounting, cutting tools, and drill bits for equipment should be inspected regularly.

3、Electric tools must be checked and equipped with leakage devices to avoid potential risks.

4、Secure solar mounting systems and PV modules to prevent movement or falling during transit. When using forklifts or handling equipment, ensure no collisions with people or other objects.

5、Ensure there is enough working space and safe access for personnel to operate and evacuate quickly in an emergency. Use proper, qualified tools to secure the installation and prevent tools from slipping and injuring someone, especially when working at heights.

III、SYSTEM

3.1 System Overview

This product is the Double Piling Solar Mounting System.

It's a highly efficient, stable, and reliable support structure designed for large-scale photovoltaic projects. Thanks to its stability and wind resistance, it can be used in various terrains, including mountains, plains, and hills, and supporting multiple tilt angles.

3.2 Basic Component

No.	Item	Spec	Qty
1	Beam	C75*45*10*2	7
2	Purlin A5	C110*55*15*2	4
3	Purlin A6	C110*55*15*2	4
4	Purlin A7	C110*55*15*2	4
5	Purlin A8	C110*55*15*2	4
6	Front brace	C50*40*10*1.8	7
7	Rear brace	C50*40*10*1.8	7
8	Front piling	Ø63.5*2	7
9	Rear piling	Ø63.5*2	7
10	L-connector (hot-rolled)	L100*63*6	28
11	Pull rod between rear piling 2	Ø10	6
12	Triangle connector	C72*85*3	14
13	Hold hoop 1 (one of a pair)	D76*60*4	14
14	Hold hoop 2 (one of a pair)	D76*60*4	14
15	Hold hoop 3 (a pair)	D63.5*50*3	12
16	Purlin splice 2	C118*58*3	12
17	Pull rod connector (hot-rolled)	L75*50*5	12
18	Beam reinforcement	C69*39*2.5	28
19	Purlin support	L35*1.6	6
20	Outer hex screw kit1 (bolts for panel)	M8*25	208
21	Plain washer 1	16*35*3	208
22	Outer hex screw kit 2 (bolts to L-connector and purlin)	M12*45	28
23	Outer hex screw kit 4 (bolts to purlin and beam)	M12*45	28
24	Outer hex screw kit 5 (bolts to purlin splice and purlin)	M10*40	144
25	Outer hex screw kit 6 (bolts to triangular connector and beam)	M12*45	28
26	Outer hex screw kit 7 (bolts to brace and beam)	M14*50	14
27	Outer hex screw kit 8 (bolts to triangular splice and piling)	M14*120	14
28	Outer hex screw kit 9 (bolts to hold hoop and brace)	M14*75	28
29	Nut accessory 1 (pull rod splice)	M10	12
30	Outer hex screw kit 10 (bolt to pull rod and hoop)	M12*70	24
31	Outer hex screw kit 11 (bolt to purlin support and purlin)	M10*40	24
32	Outer hex screw kit 12 (bolt for beam reinforcement)	M12*45	56
33	Washer	Ø63.5	14

IV、PLANNING

4.1 Installation Environment

1、Installation conditions: flat terrain, no shrubs or buildings around, away from coastal and high salt spray environments, low atmospheric corrosion C2 environment.

2、Dimensions and weight of photovoltaic modules: 2278mm*1134mm*30 mm (length * width * thickness) 30~32kg

3、Wind load: (once every 50 years): 0.55kN/m²

Snow load: (once every 50 years): 0.20kN/m²

4.2 Tilt Angle

The angle between the photovoltaic panel and the horizontal plane is 34°.

4.3 Column Spacing

In the Shache County project in Xinjiang, the distance between the front and rear columns is 2700 mm, with each span measuring 4000 mm.

V、TOOLS AND EQUIPMENT

5.1 Pre-installation Preparation

1、Review the design plan to ensure it meets on-site conditions and relevant standards, and familiarize yourself with the construction drawings and technical requirements.

2、A safe and reliable installation environment is needed for installation.

3、Foundation construction should meet design requirements, ensuring the accuracy and the height of concrete foundation surface from the ground.

4、Gather all necessary tools, check the component list, and ensure all parts have arrived and are ready for use.

5、Check the weather and environment to ensure a safe installation environment.

6、Personnel should wear necessary safety equipment, and safety warning signs should be posted at the construction site to mark dangerous areas.

7、Permits and approvals from relevant departments should be obtained before installation.

8、Detailed emergency plans are prepared for any potential safety incidents and emergencies.

5.2 Required Tools For Assembly

① Measuring tools
tape measure、spirit level
level、protractor、theodolite

② Tightening tools
adjustable wrenches、open-end wrenches
torque wrenches、and electric wrenches

③ Drilling tools
an electric drill、impact drill

④ Cutting tools
an angle grinder and electric saw

⑤ Lifting tools
cranes、forklifts、gantry cranes
hoists、and elevators

⑥ Welding tools
welding machines and welding masks

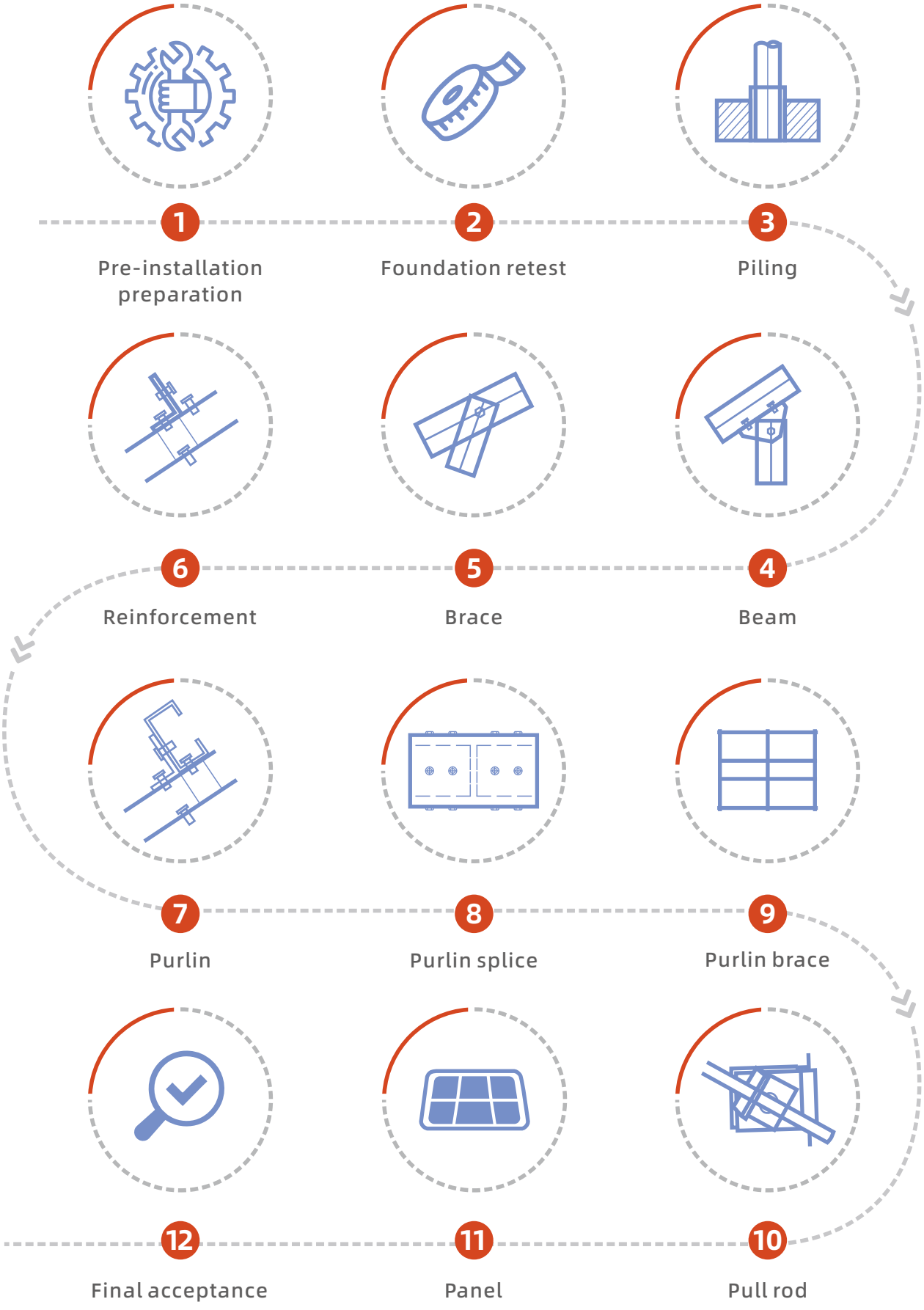
⑦ Striking tools
hammer

⑧ Tool kits
storage tools、small tools
and their parts

⑨ Safety protective equipment
safety helmets、safety belts
safety shoes、gloves、and goggles

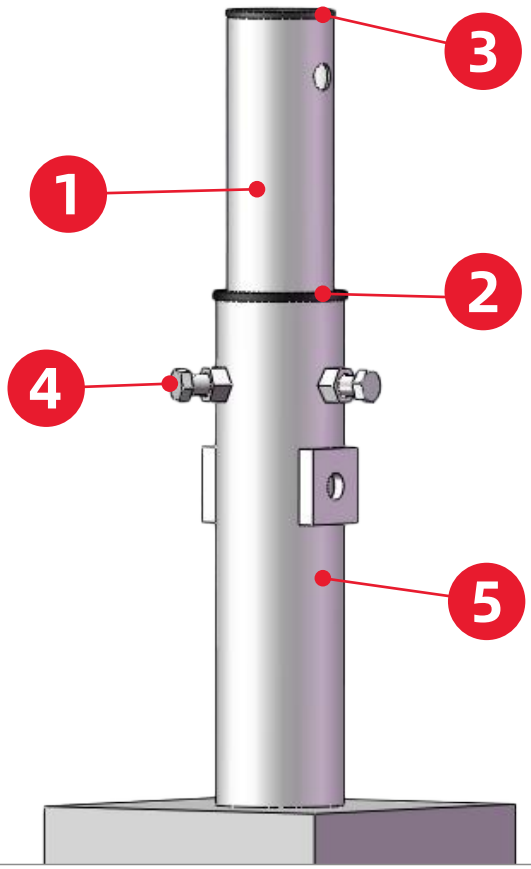
VI、INSTALLATION GUIDE

6.1 Installation Procedures



6.2 Double Piling Installation

Piling



COMPONENTS

1 **Front piling**
Qty:7 | Spec:Ø63.5*2

2 **Waterproof O-ring**
Qty:7

3 **Washer**
Qty:7 | Spec:Ø63.5

4 **Locking bolt**
Qty:21

5 **Piling sleeve**
Qty:7

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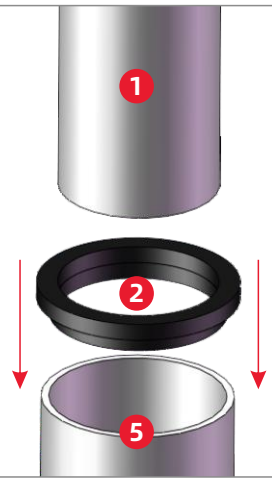
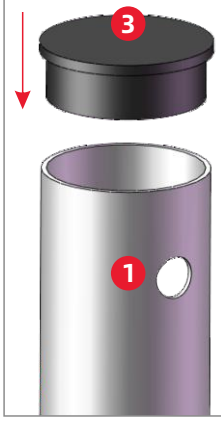


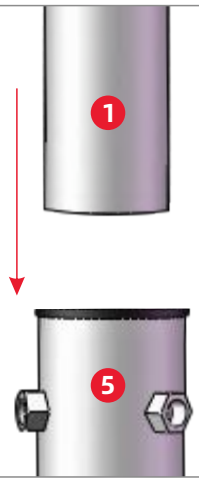
Place the waterproof O-ring on the piling sleeve

II



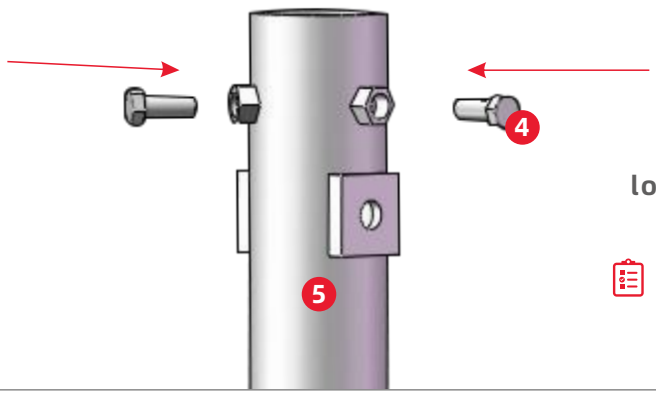
Place the washer on the front piling

III



Insert the front piling into the sleeve and adjust the piling's verticality, ensuring the tops of the pilings in the same table are at the same height

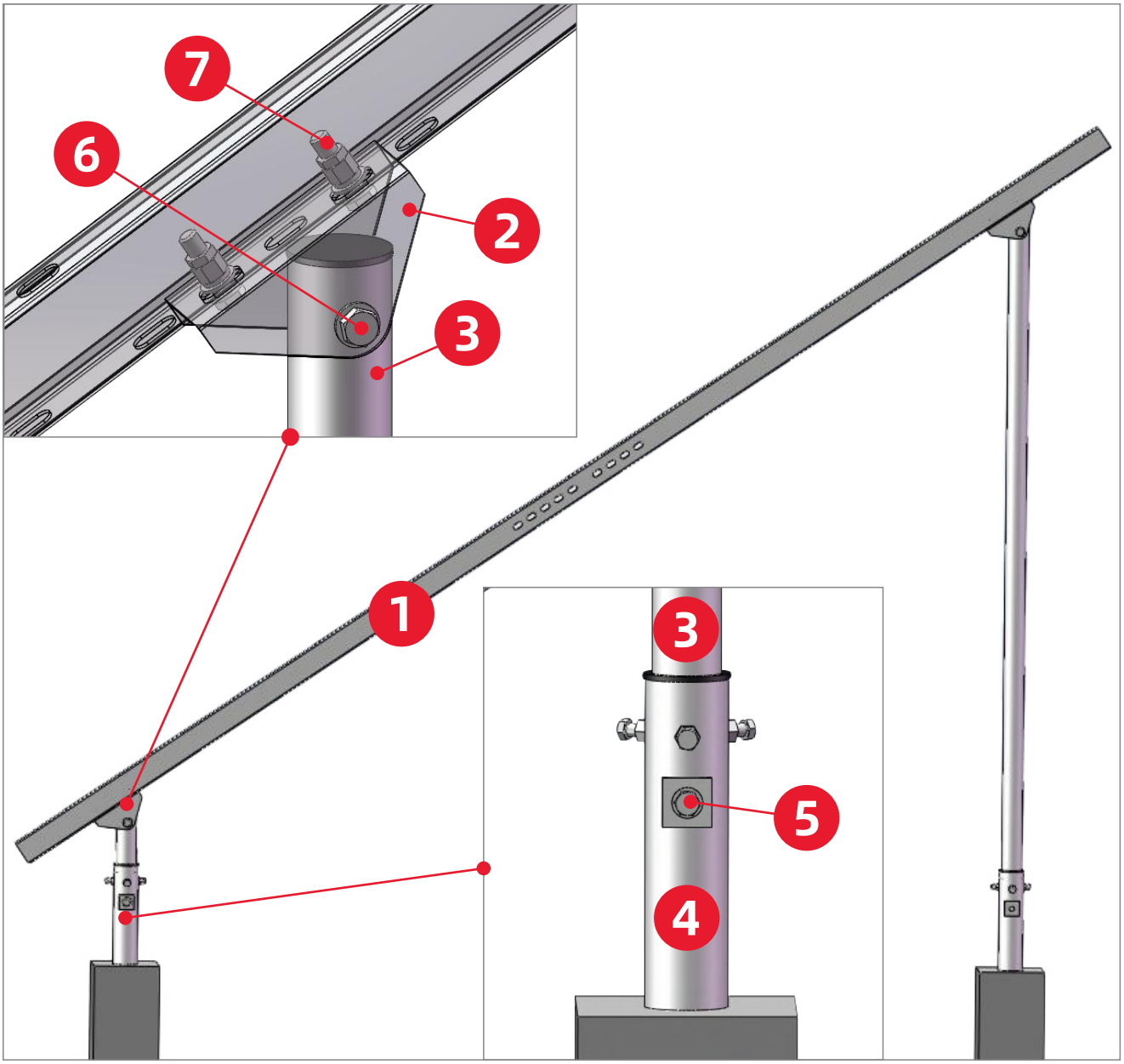
IV



Screw locking bolt into the locking nut on the piling sleeve

Same for the rear piling.

Beam



COMPONENTS

1 Beam
Qty:7

2 Triangle connector
Qty:14

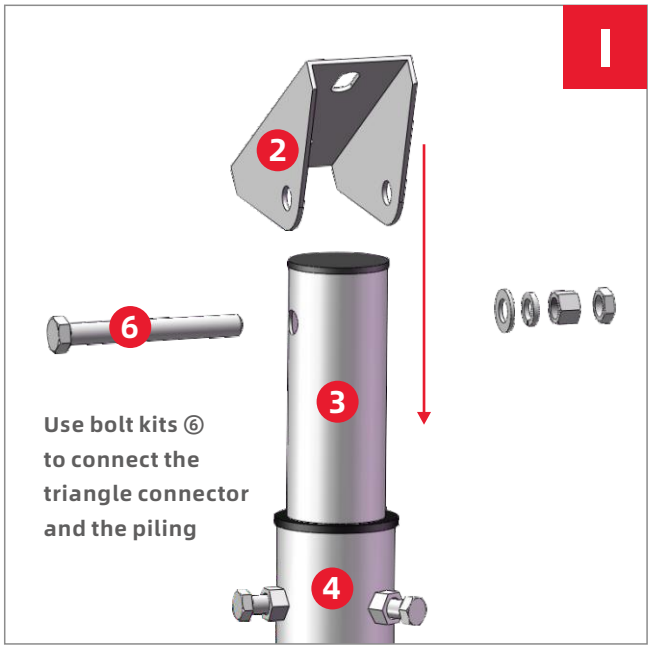
3 Piling
Qty:14

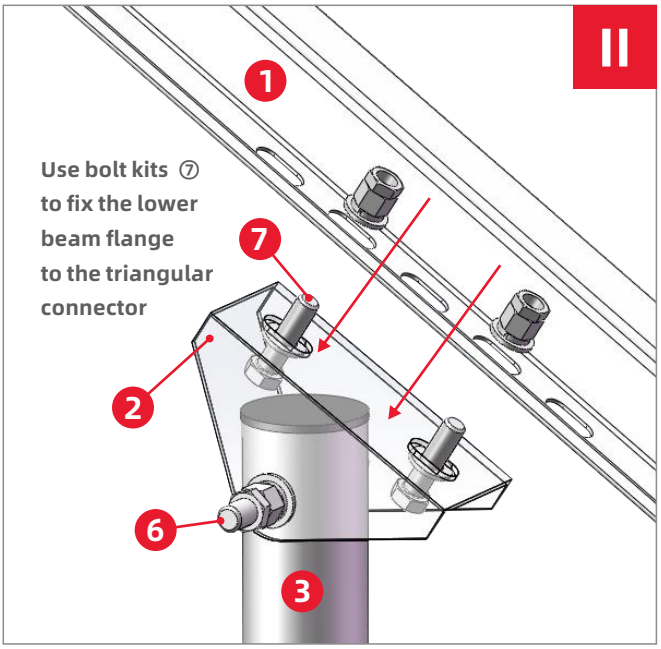
4 Piling sleeve
Qty:14

5 Bolt kits
Qty:14 | Spec : M14*130
Accs: plain washers * 2
spring washer * 1 regular nut * 1

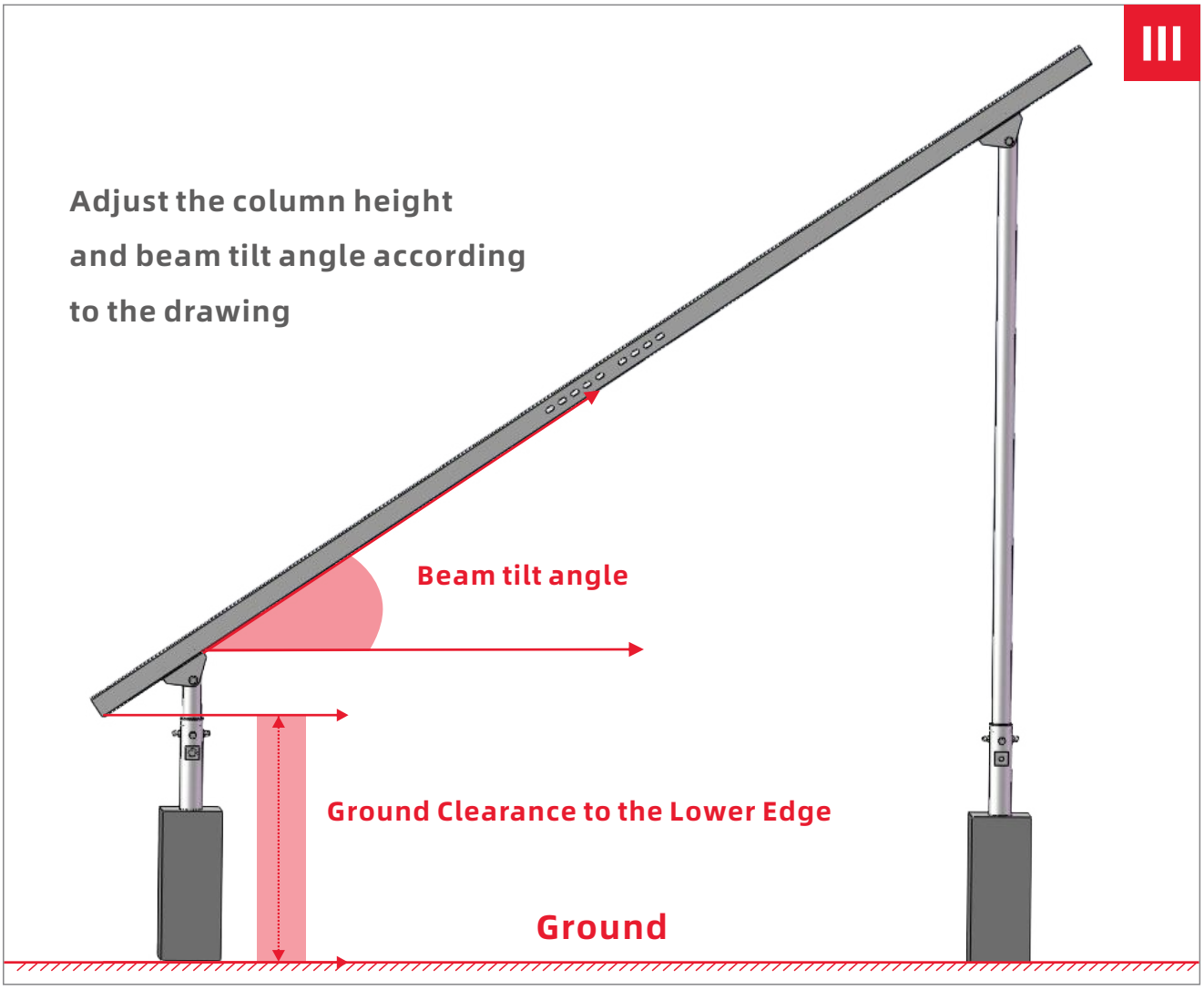
6 Bolt kits to piling and triangle connector
Qty:14 | Spec : M14*120
Accs: plain washers * 2、spring washer * 1
regular nut * 1 thin nut * 1

7 Bolt kits to triangle connector and beam
Qty:28 | Spec : M12*45
Accs: plain washers * 2 spring washer * 1 regular nut * 1 thin nut * 1





Finished beam installation ▶▶



Brace

COMPONENTS

① Beam	② Brace	③ Piling sleeve	④ Hold hoop 1	⑤ Hold hoop 2
Qty:7	Qty:14	Qty:14	Qty:14	Qty:14

⑥ Bolt kits for hold hoop

Qty: 28 | Spec : M14*75

Accs:large plain washers * 2

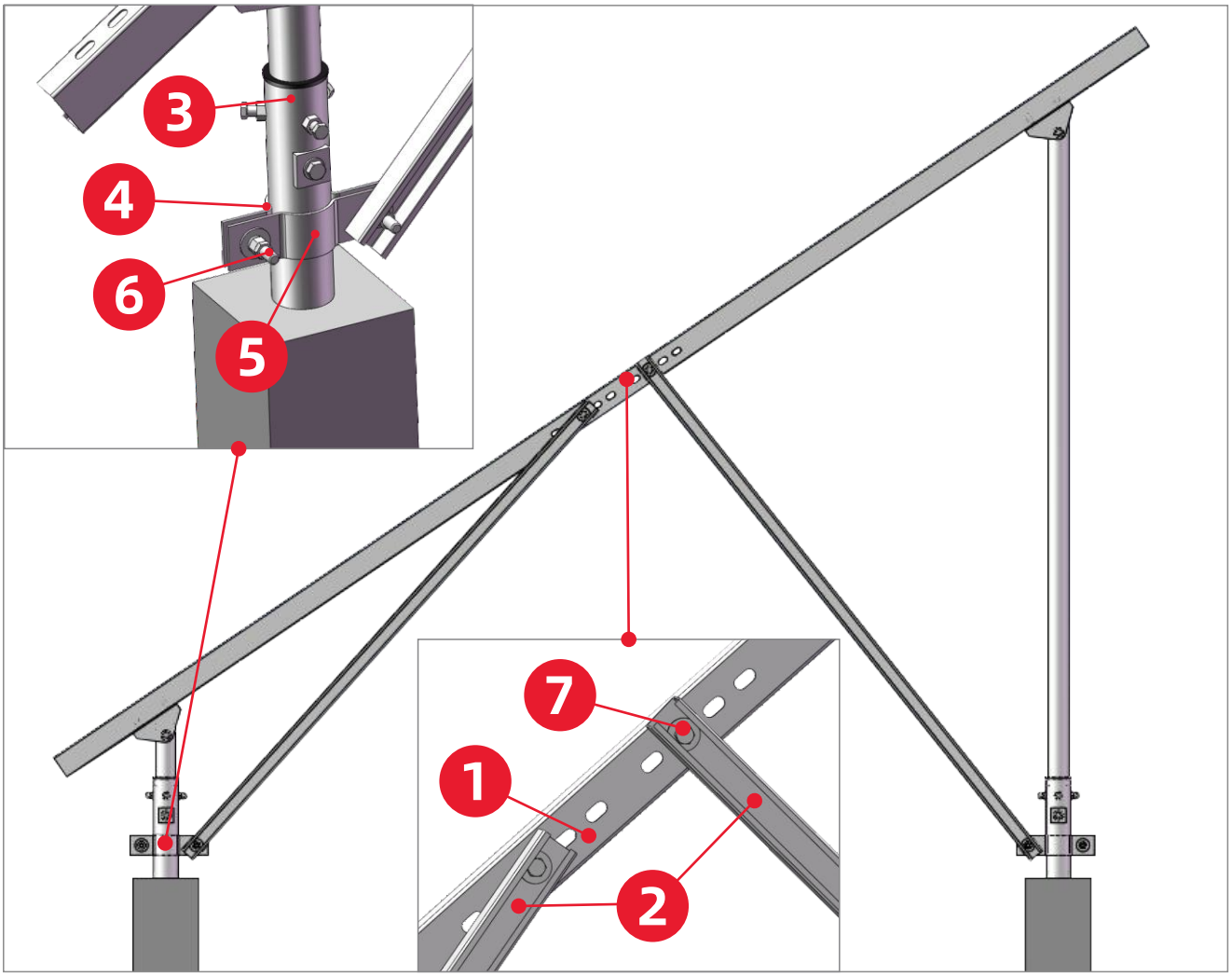
spring washer *1 regular nut * 1 thin nut * 1

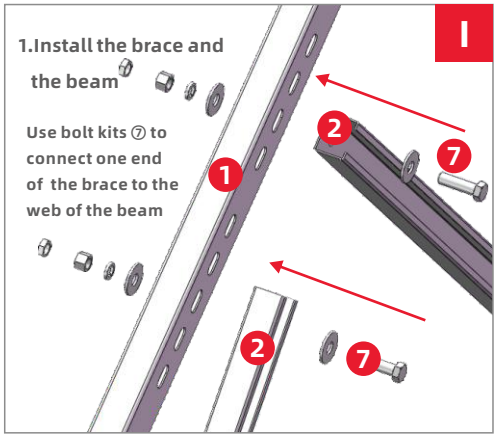
⑦ Bolt kits for brace

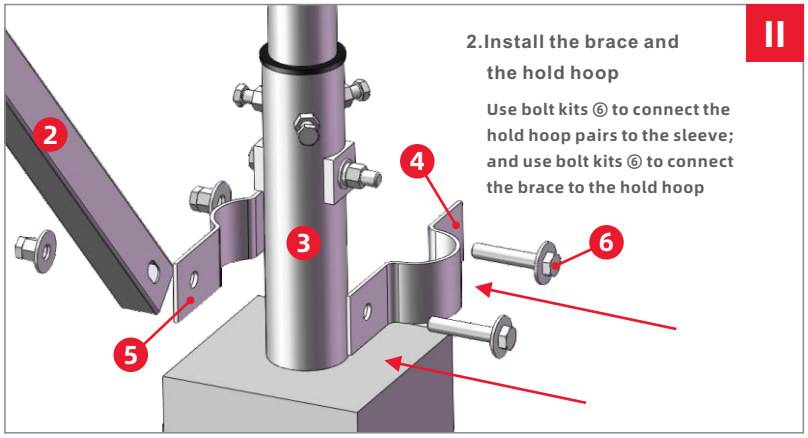
Qty: 14 | Spec : M14*50

Accs: large plain washers*2 (OD:40 thickness3)

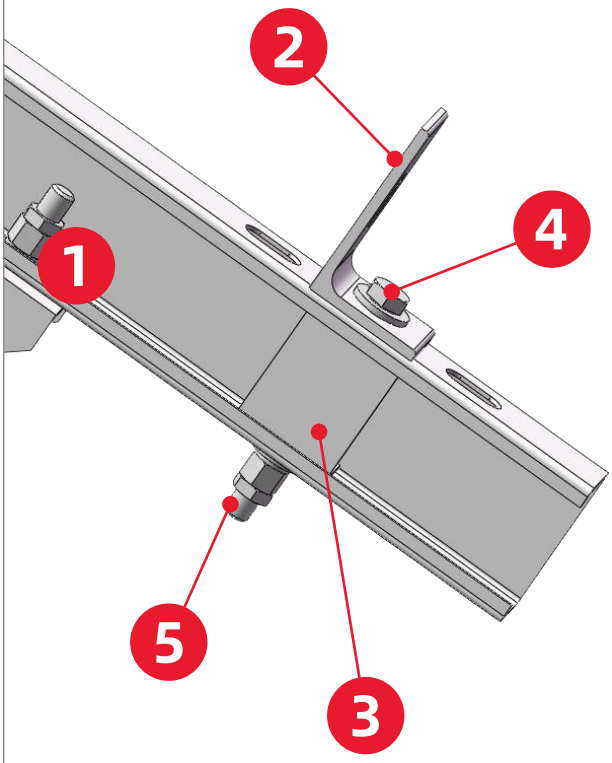
spring washer * 1 regular nut * 1 thin nut * 1







Reinforcement



COMPONENTS

1 Beam

Qty:7

2 L-connector

Qty:28

3 Beam reinforcement

Qty:28

4 Bolt kits to beam and L-connector

Qty:28 | Spec : M12*45

Accs: large plain washers * 2 spring washer * 1

regular nut * 1 thin nut * 1

5 Bolt kits for beam reinforcement

Qty:28 | Spec: M12*45

Accs: large plain washers * 2 spring washer * 1

regular nut * 1 thin nut * 1

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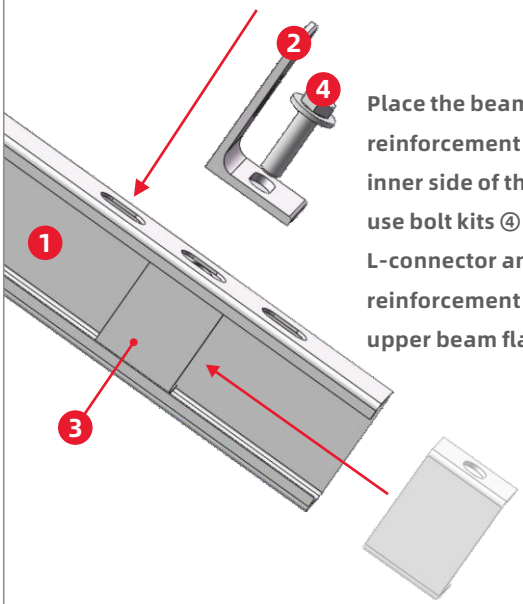
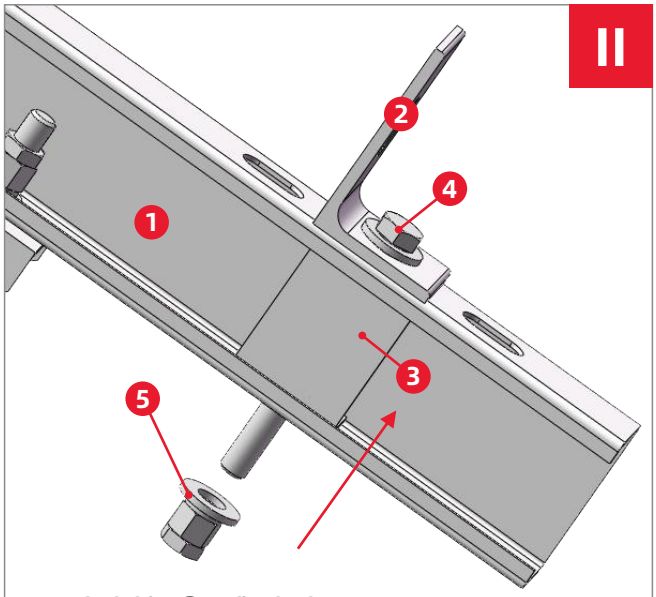


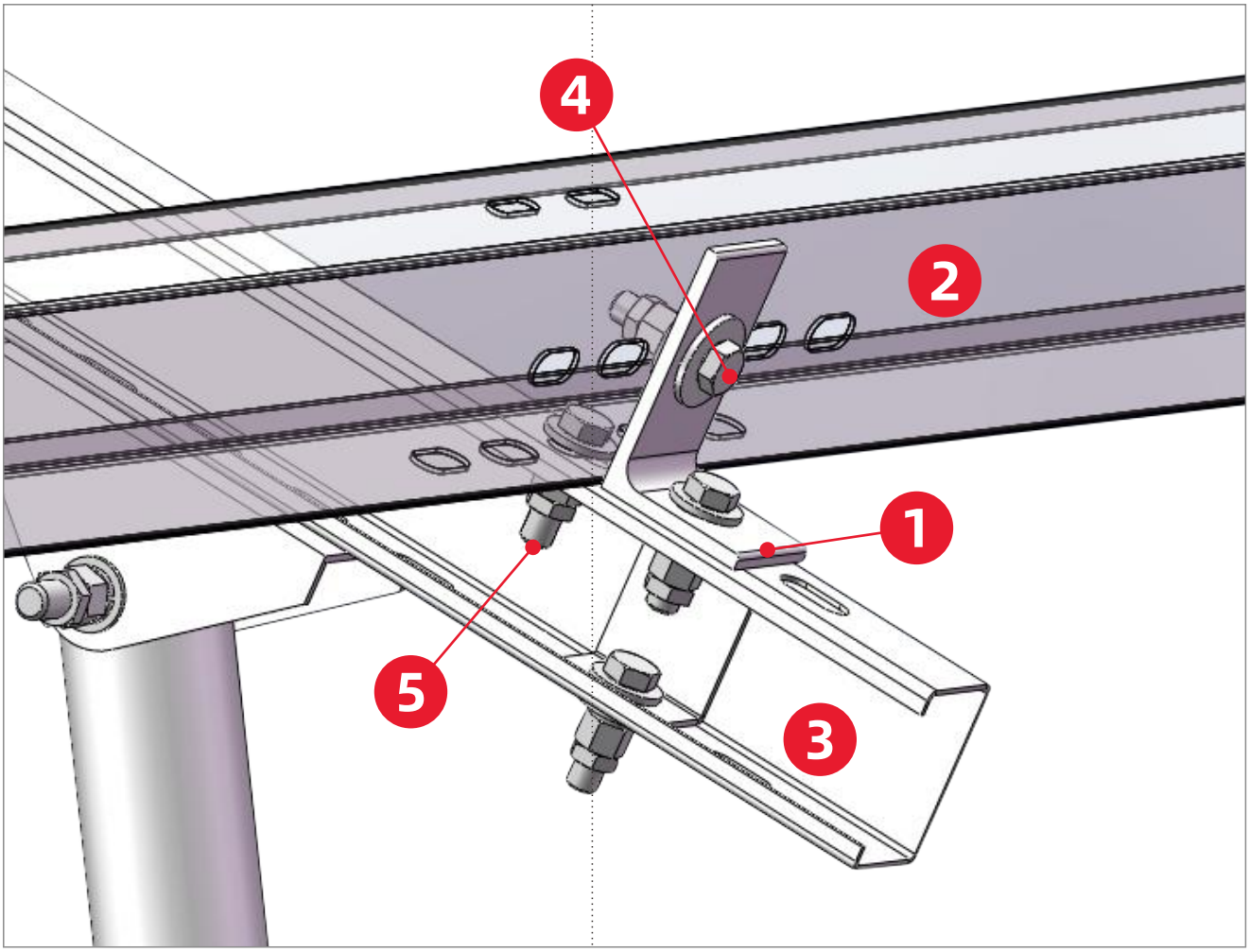
Place the beam reinforcement on the inner side of the beam; use bolt kits ④ to fix the L-connector and beam reinforcement on the upper beam flange

II



Use bolt kits ⑤ to fix the beam reinforcement to the lower beam flange

Purlin



COMPONENTS

1 L-connector

Qty:28

2 Purlin **3 Beam**

Qty:4 Qty:7

4 Bolt kits to purlin and L-connector

Qty:28 | Spec : M12*45

Accs: large plain washers * 2

spring washer * 1 regular nut * 1

thin nut * 1

5 Bolt kits to purlin and the upper beam flange

Qty:28 | Spec : M12*45

Accs: large plain washers * 2

spring washer * 1 thin nut * 1

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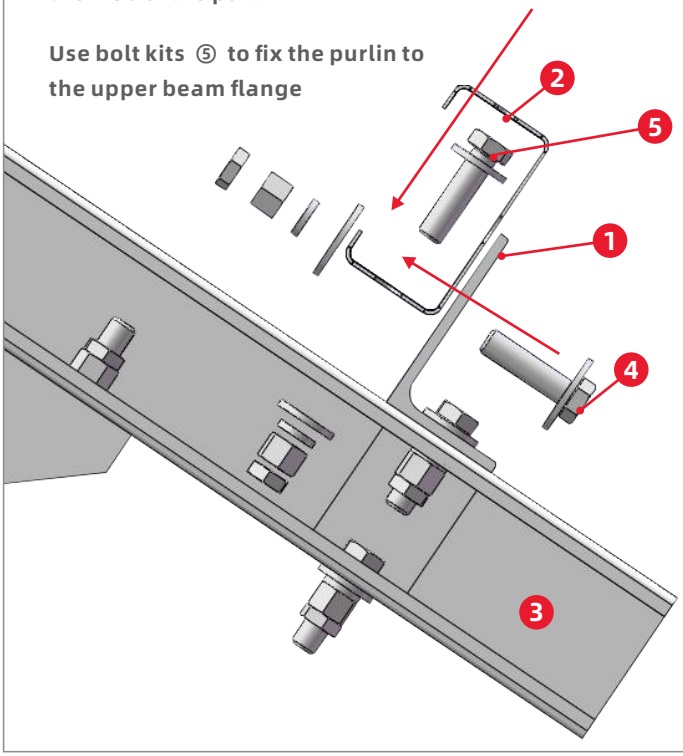
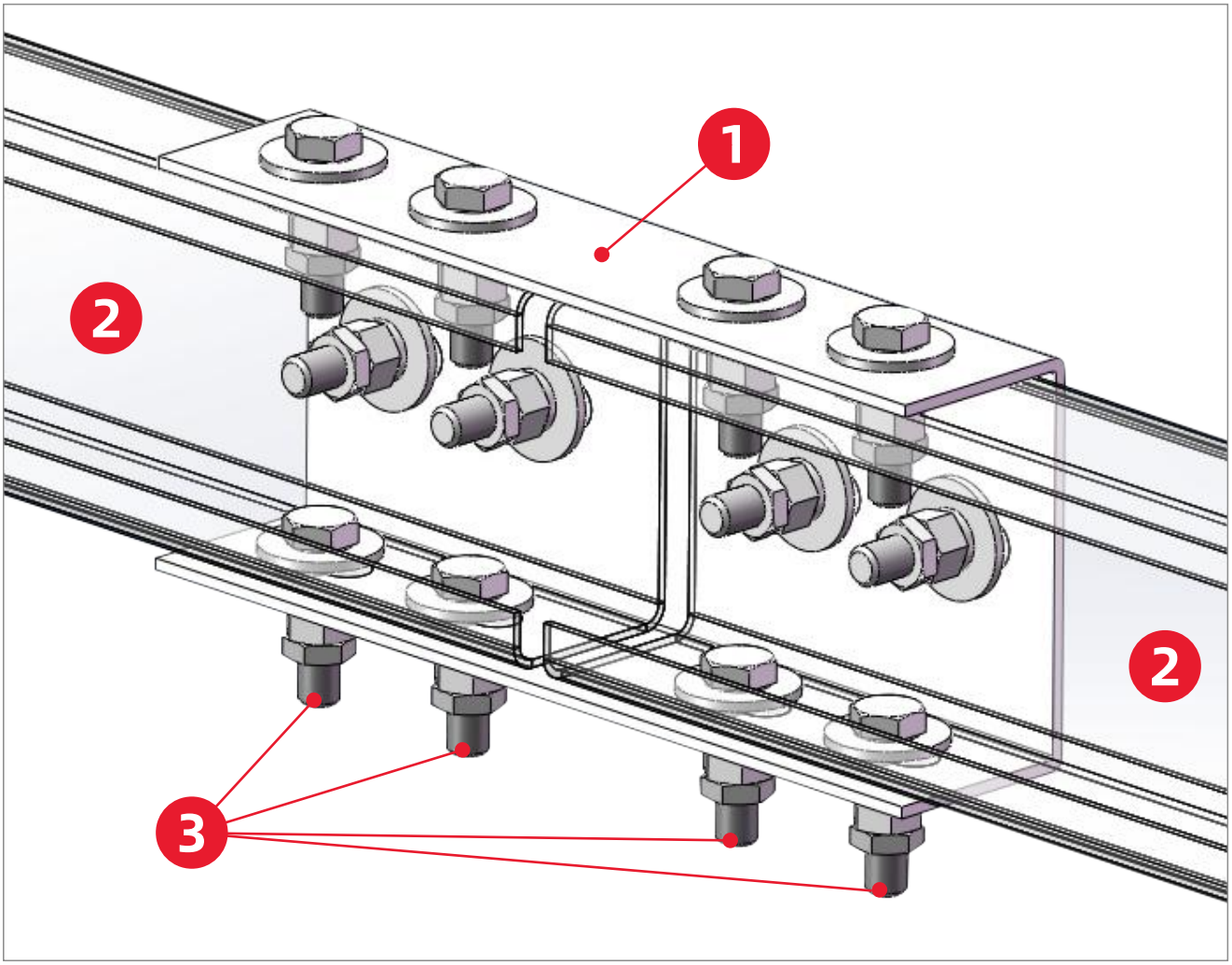
Use bolt kits ④ to fix the L-connector and the web of the purlin

Use bolt kits ⑤ to fix the purlin to the upper beam flange



Purlin splice



COMPONENTS

1 Purlin splice

Qty:12

2 Purlin

Qty:4

3 Bolt kits to purlin splice and purlin

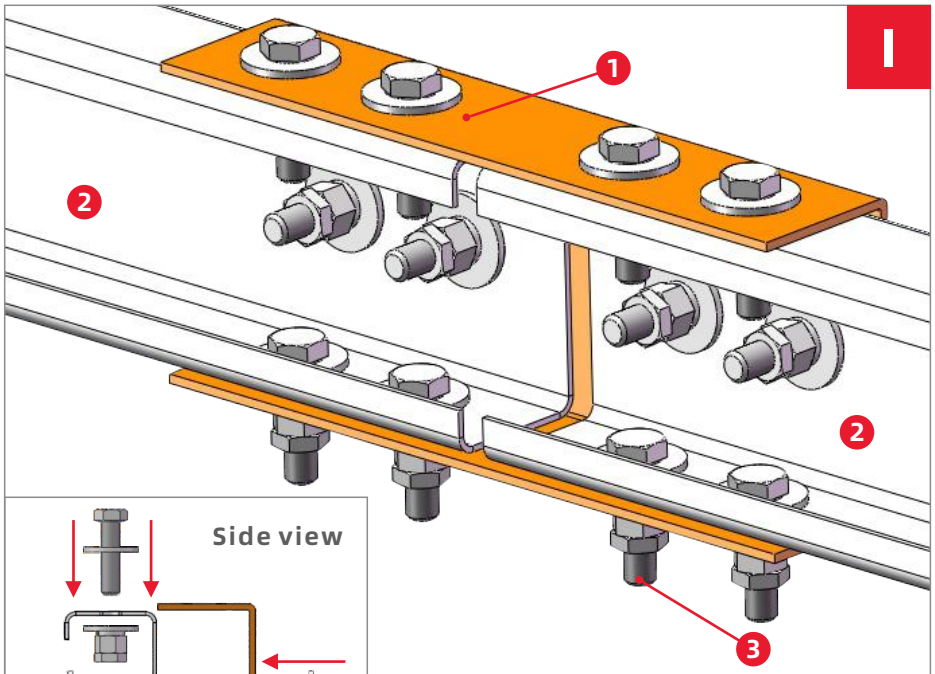
Qty:144

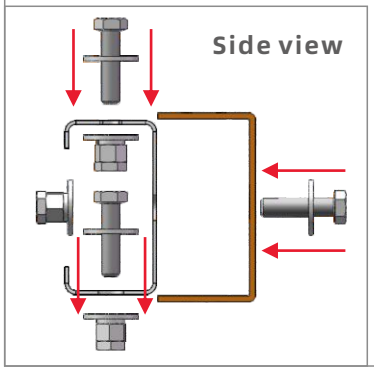
Spec： M10*40

Accs:large plain washers * 2

spring washer * 1

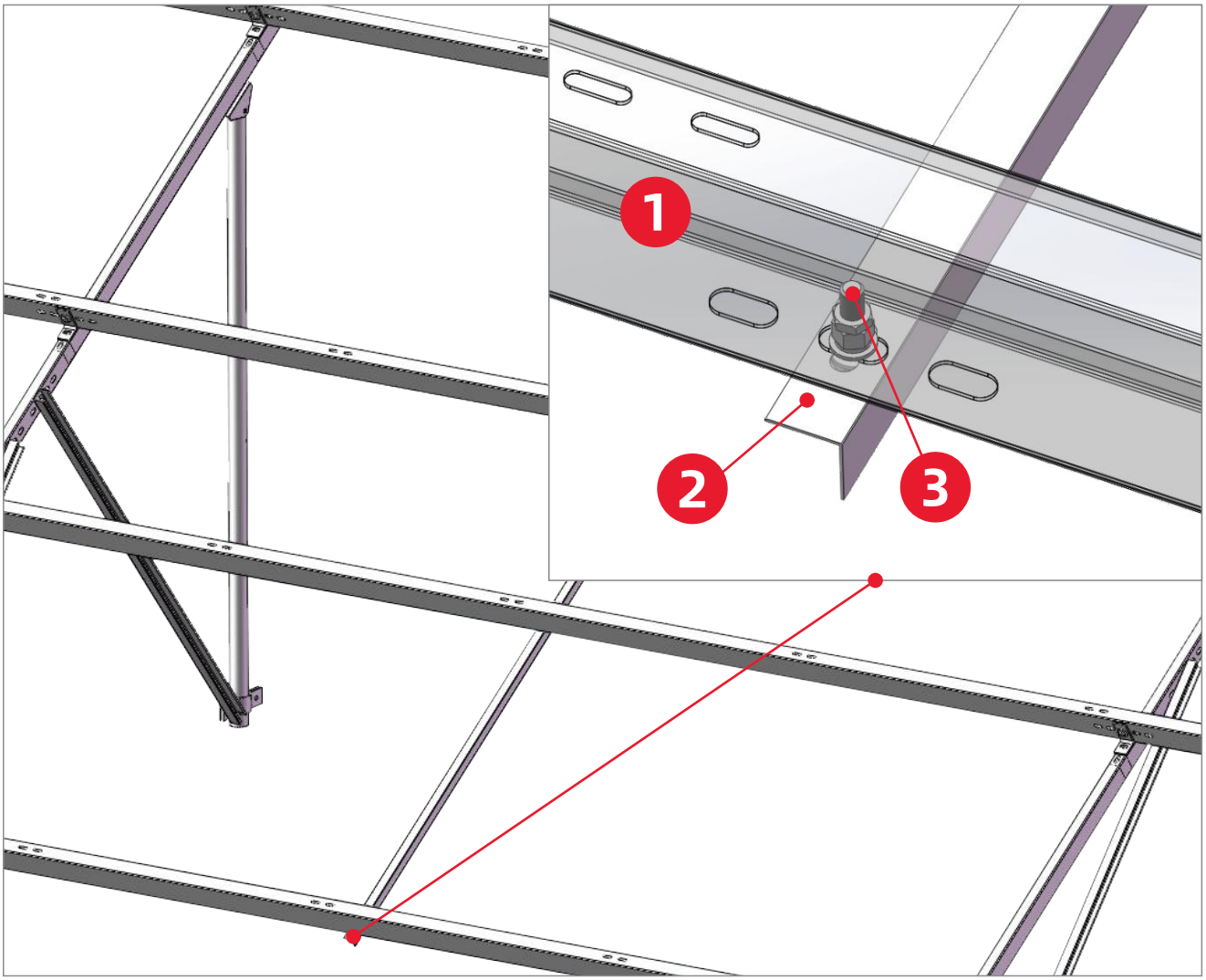
regular nut * 1　thin nut * 1





Use the bolt kits ③ to fix the purlin splice and the purlin

Purlin brace



COMPONENTS

1 Purlin

Qty:4

2 Purlin brace

Qty:6

3 Bolt kits to purlin and purlin brace

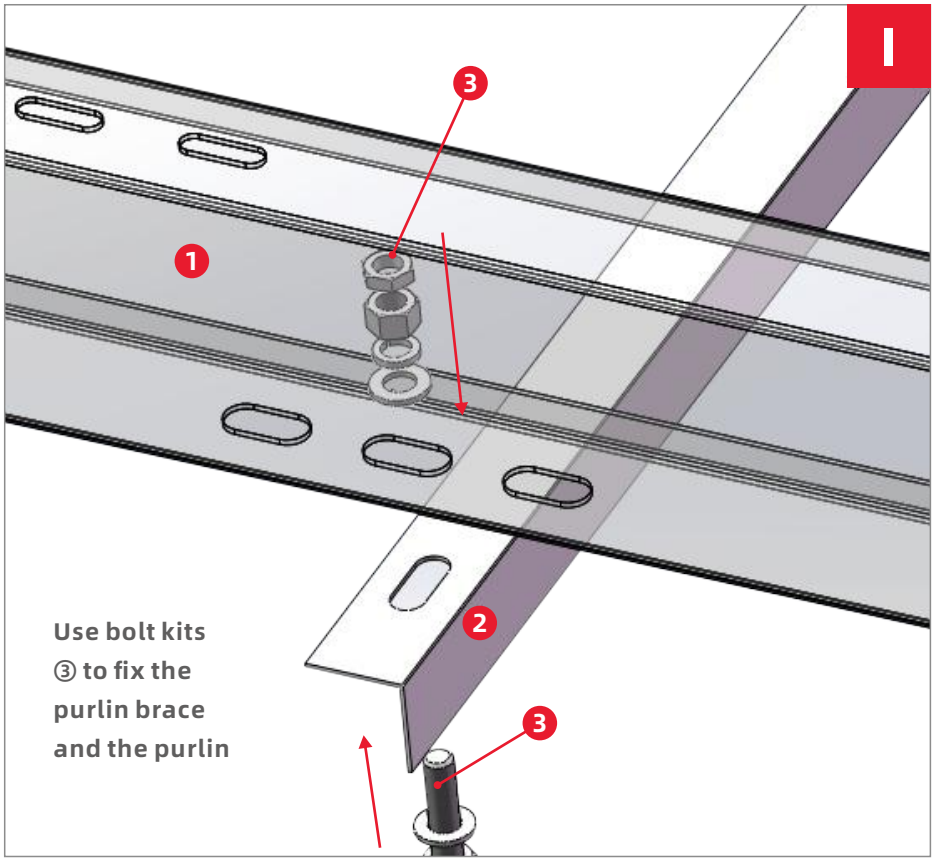
Qty:24

Spec: M10*40

Accs: plain washers * 2

spring washer * 1

regular nut * 1 thin nut * 1



Pull rod

COMPONENTS

1 Piling
Qty:7

2 Pull rod
Qty:6

3 Pull rod connector
Qty:12

4 Hold hoop 3 (Pair)
Qty:12

5 Self-locking bolt kits for hold hoop3

Qty:24

Spec： M12*70

Accs:plain washers * 2 spring washer * 1

regular nut * 1 thin nut * 1

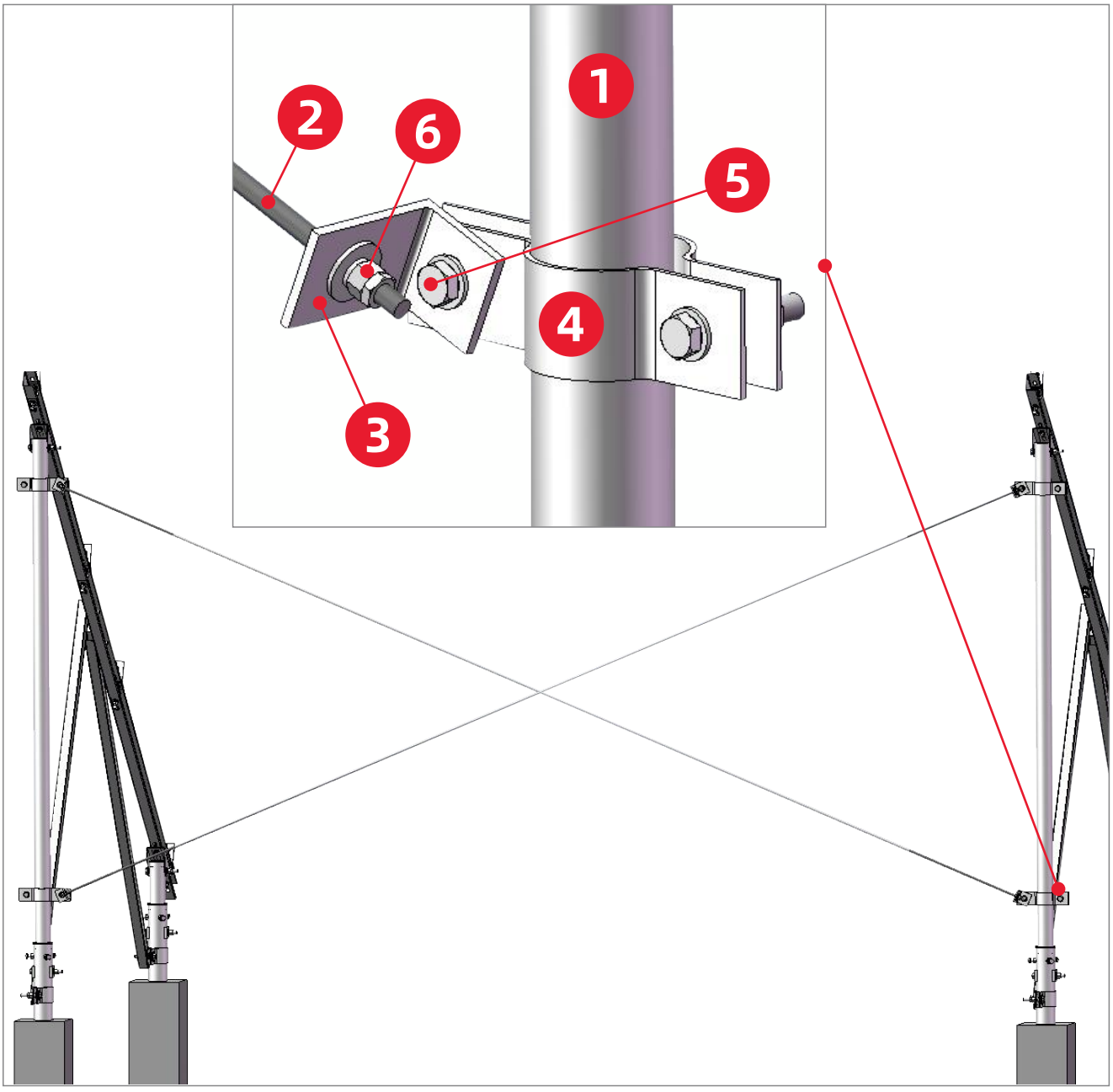
6 Bolt kits for pull rod

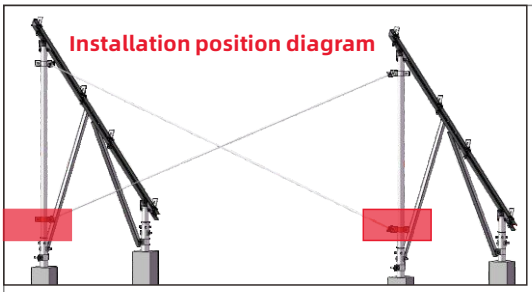
Qty:12

Spec： M10

Accs:plain washers * 2 spring washer * 1

regular nut * 1 thin nut * 1





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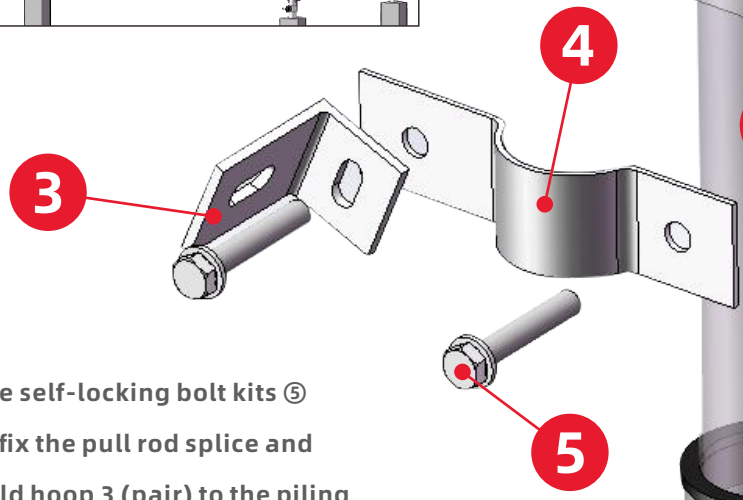
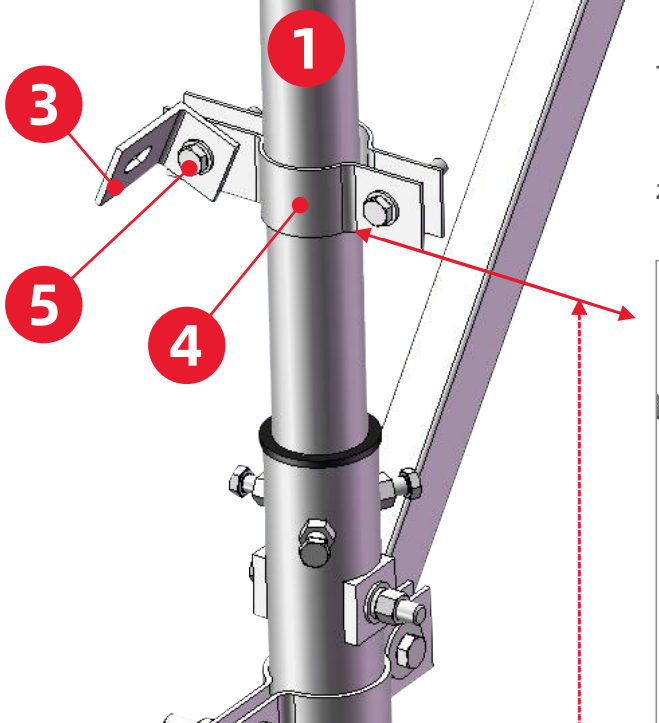


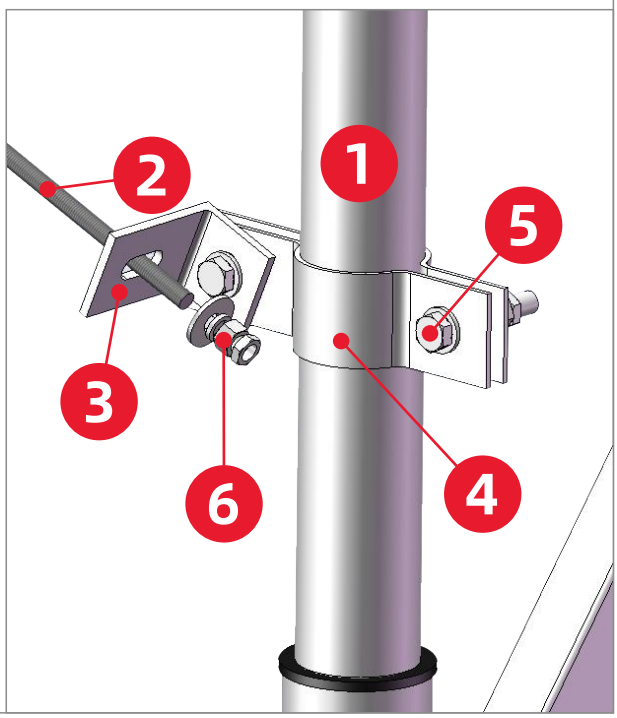
Use self-locking bolt kits ⑤
to fix the pull rod splice and
hold hoop 3 (pair) to the piling

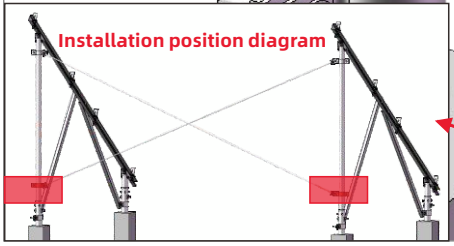
II



1.Adjust the height of the hold hoop 3 (pair)
to allow the pull rod to pass through the splice

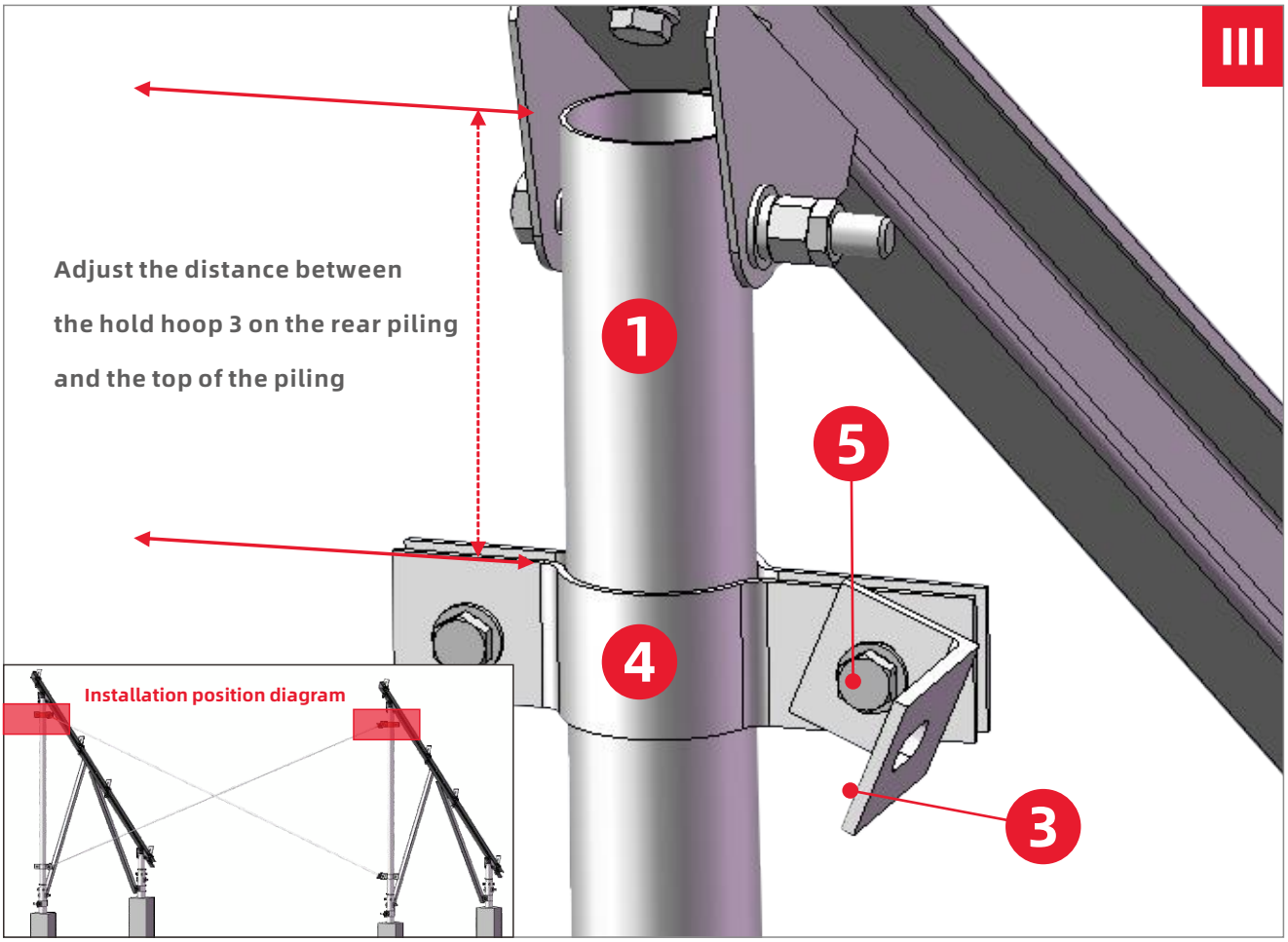
2.Use bolt kits ⑥ to fix the pull rod to the splice





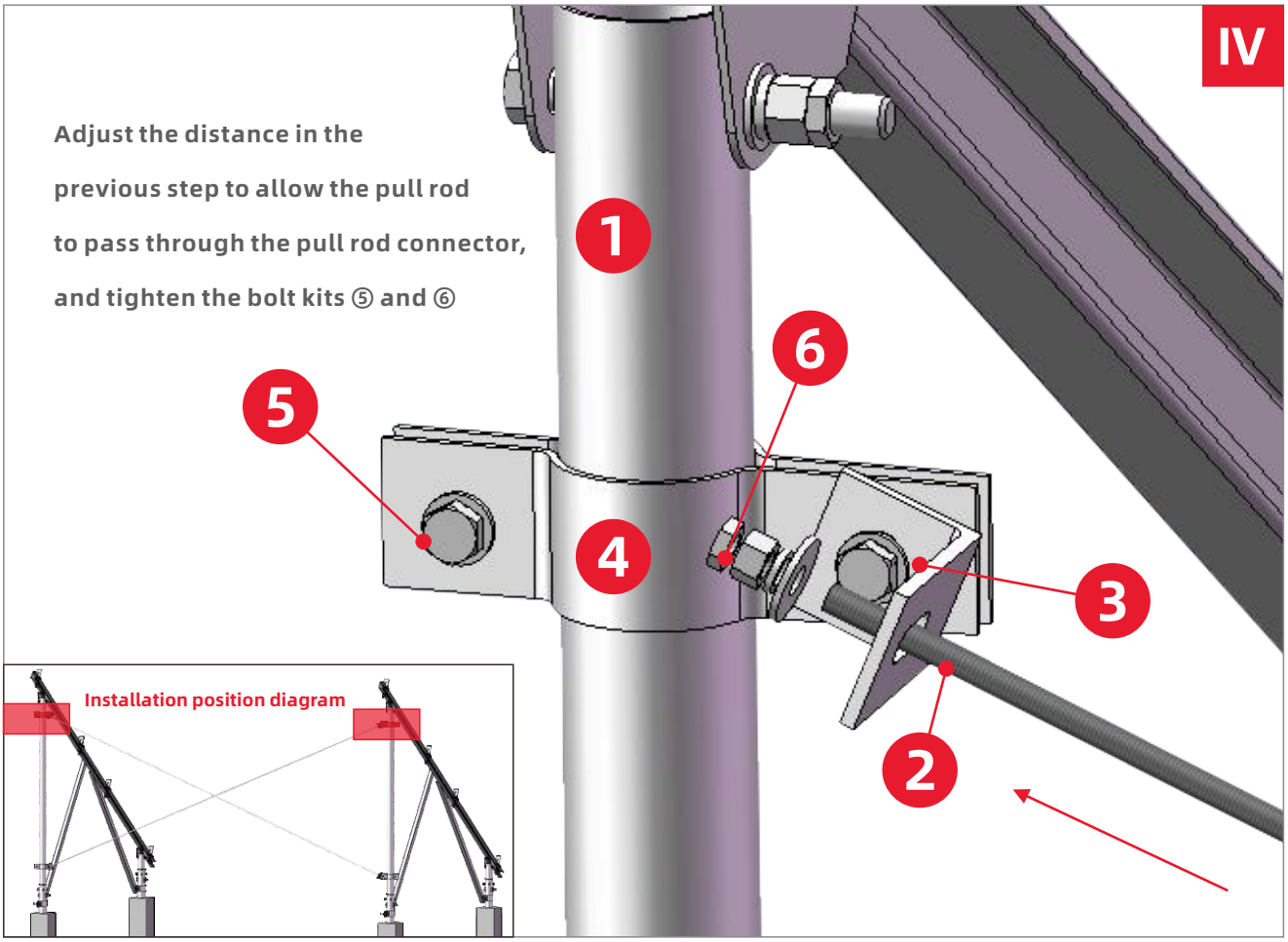
III

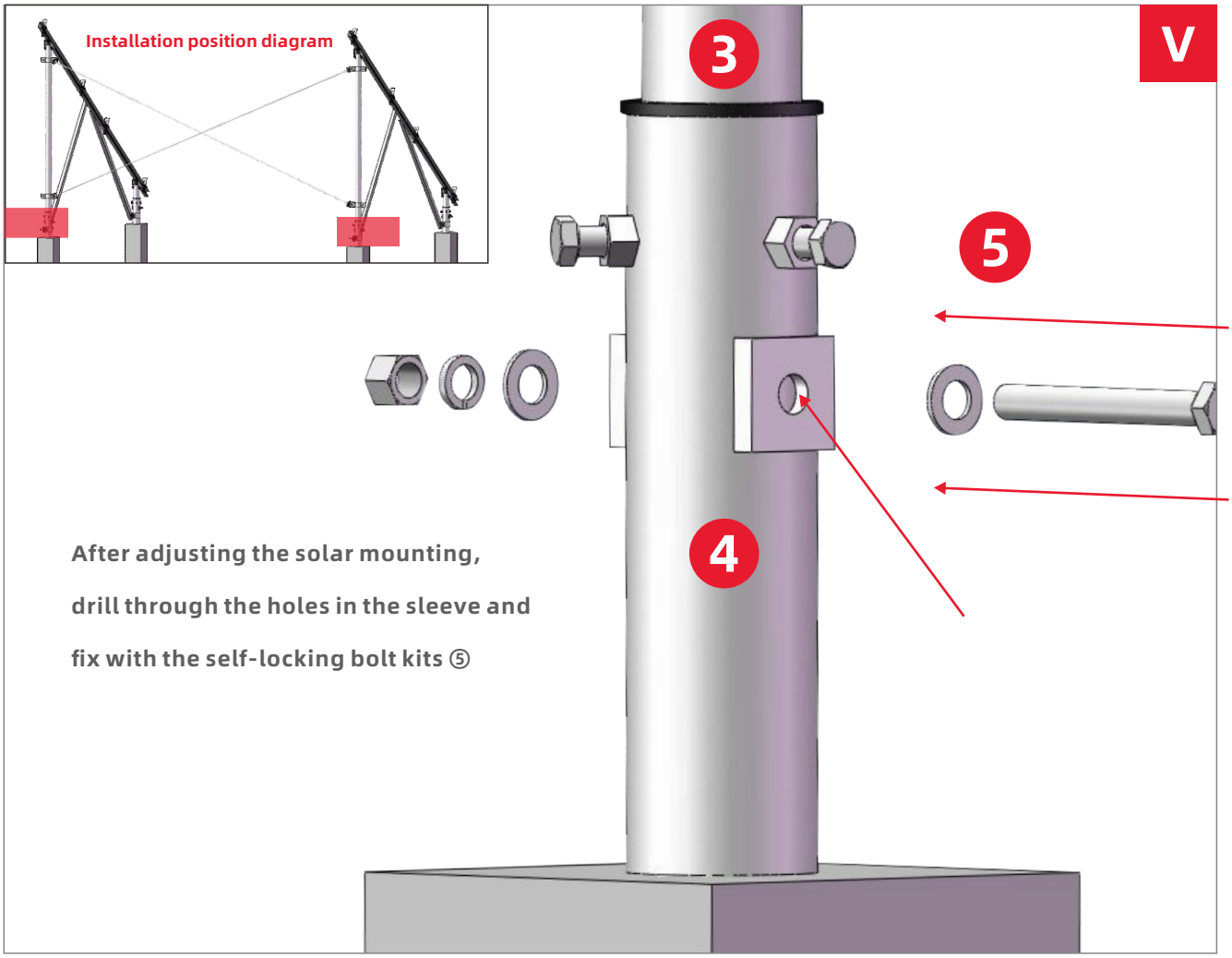
Adjust the distance between
the hold hoop 3 on the rear piling
and the top of the piling



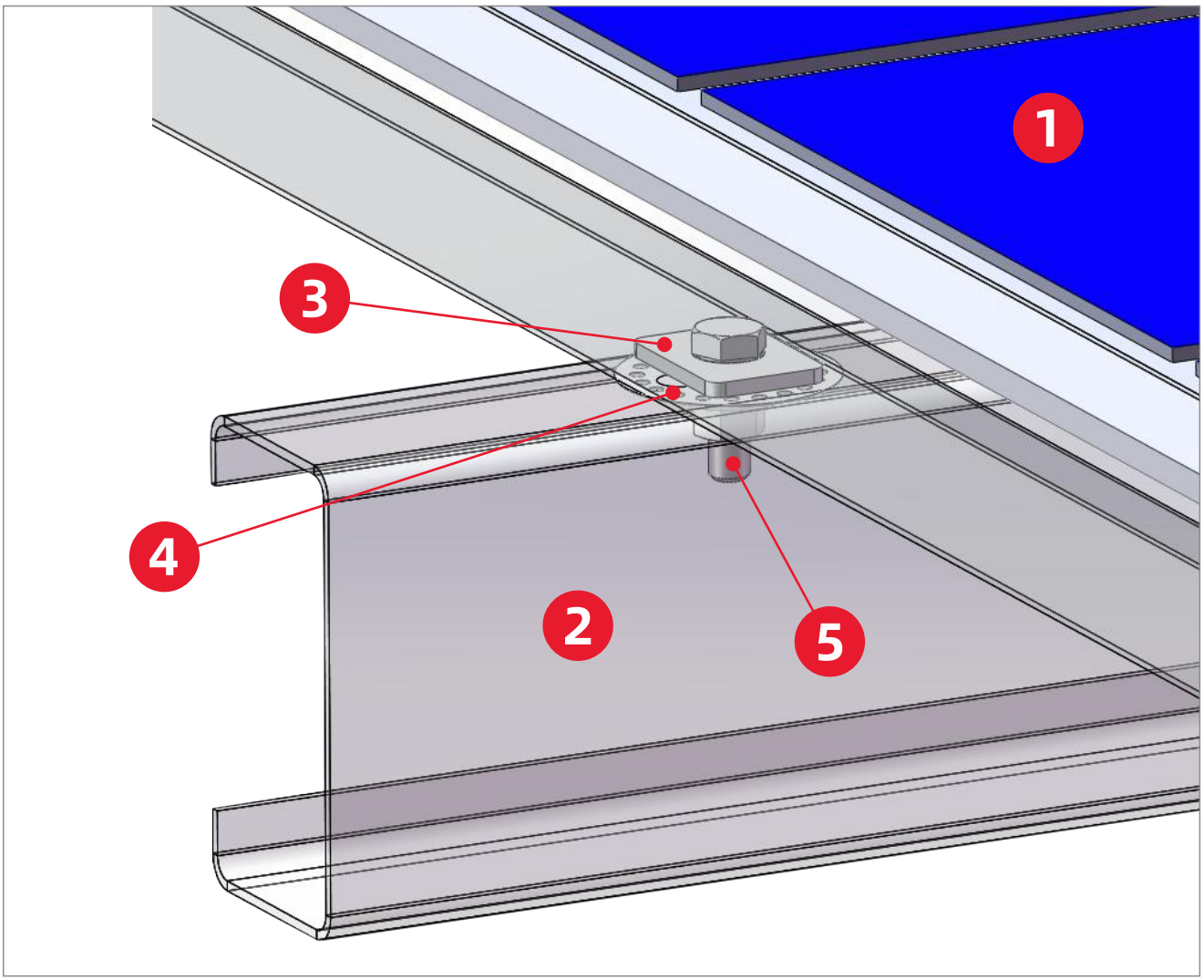
IV

Adjust the distance in the
previous step to allow the pull rod
to pass through the pull rod connector,
and tighten the bolt kits ⑤ and ⑥




Installation position diagram
V
3
5
4
After adjusting the solar mounting,
drill through the holes in the sleeve and
fix with the self-locking bolt kits ⑤

Panel



COMPONENTS

1 Panel Qty:52

2 Purlin Qty:4

3 Plain washer

Qty:208

4 Grounding washer

Qty:208

5 Bolt kits for panel

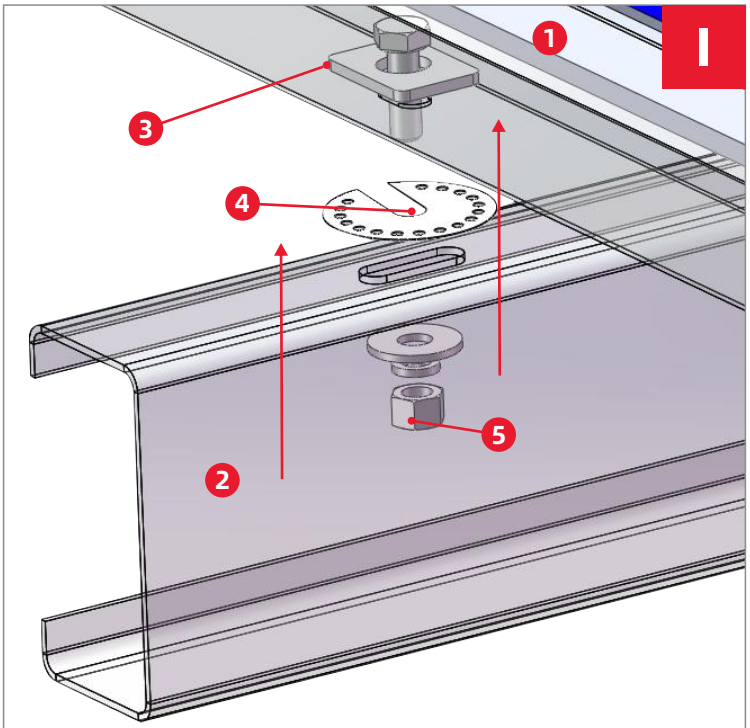
Qty:208 | Spec: M8*25

Accs: square washers * 1

large plain washer * 1

spring washer * 1 regular nut * 1

solar grounding washer * 1



Use bolt kits to fix the panel with the purlin
And the grounding washer should be installed
between the panel and the purlin

Ⅶ、CAUTIONS

7.1 Installation Inspection

1、The mounting system verticality and tilt angle deviation should not exceed ±1.

2、The ground clearance should be within the fixed range;(≤3mm)

(ground clearance refers to height of the lowest point of the sloped beam from the ground)

3、Bolts must be tightened to meet the design torque requirements.

4、If the anti-corrosive layer is damaged during transportation or installation, clean the area and then repair it with epoxy zinc-rich paint.

7.2 Receiving And Storage

Receiving

Please check the quantity promptly upon arrival.

Unloading and handling

To prevent personal injury and damage to the goods during unloading and handling, follow these recommendations:

WEIGHT OF GOODS	OPERATIONAL SPECIFICATIONS
< 18kg	One person
18kg - 45kg	Two or more people
> 45kg	A forklift or other appropriate lifting equipment is needed.

Storage

1、Store the product in a dry, well-ventilated warehouse. If stored outdoors, cover it to prevent moisture and waterlogging, which can cause galvanized parts to re-alkalize.

2、The solar mounting system of different specifications and models should be classified and stored for easy access.

3、Product stacking should be done in less than 3 layers, storing flatly or uprightly. Wooden pads can be used to maintain layer stability and avoid compression.

4、Set up the storage area with fire and security measures and install warning signs.

Note: the boxes for storage must be dry.

7.3 Nonconforming Notifications

1、Regular inspection: a specialist conducts thorough inspections of on-site products, documenting any issues and the inspection outcomes.

2、Nonconforming notification: if the mounts do not match the drawings, notify on-site workers via email, WeChat, or SMS the same day.

3、Follow-up and feedback: the responsible department must promptly address the issue and provide feedback within a set timeframe.

4、Supervision: monitor the process and outcomes to ensure the problem is resolved effectively.

7.4 Construction Operation Platform

1、Load capacity

2、Work space

3、Height

4、Stability

5、Mobility

6、The influence of climate change and extreme weather

7、Security measures

7.5 Secondary Transportation

1、Route planning: choose the right transport mode, manage vehicle speed, avoid sudden stops, and factor in road conditions and size restrictions to ensure smooth transit.

2、Product protection: use proper materials to products items, safeguarding them from damage, bumps, and scratches during the journey.

3、Stable loading: distribute the load evenly to keep the vehicle balanced and secure the products to prevent movement and falls.

4、Staffing: assign dedicated staff to supervise loading, transit, and unloading to ensure continuous product safety.

5、Storage arrangement: select level ground to prevent bending, and pre-plan storage locations to avoid rehandling and disorganized stacking.

7.6 Dimensional Considerations

1、Design requirements: confirm all dimensions align with design drawings.

2、Accuracy control: ensure dimensional accuracy meets industry standards, minimizing errors for stable installation.

3、Tolerance eange: define and strictly adhere to the allowable tolerances in production and inspection.

4、Standardization: utilize standardized components to simplify production, procurement, and future maintenance.

7.7 Cleaning and Inspection

1、Regular cleaning: clean periodically based on the environmental dust levels.

2、Coating inspection: verify that the product's coating is intact without scratches.

3、Structural integrity: check for any deformation or cracks.

4、Bolt fastening: ensure all connecting bolts are securely tightened and undamaged.

5、Surroundings: inspect the area regularly to prevent harm to plants or animals.

6、Record and report: document inspection findings, detailing issues and their locations, and report to the responsible party for action.

Notes

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