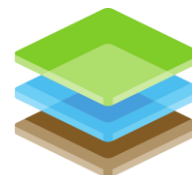


Instructions for use

E+S steel site road

Date: April 2022



terra
infrastructure

Information about the instructions for use

These instructions facilitate safe handling of the E+S steel site road. The instructions are part of the system and must be kept within close proximity of the construction site and must be accessible for personnel at all times.

Personnel must carefully read and understand these instructions before starting work. The basic requirement for working safely is adhering to all safety instructions and handling instructions given in these use instructions.

Local industrial safety regulations and general safety provisions for the application area shall also apply.

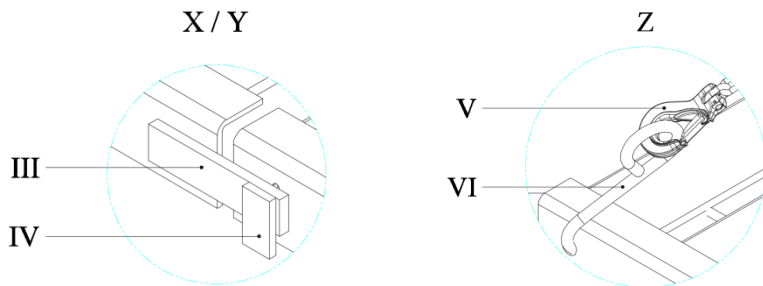
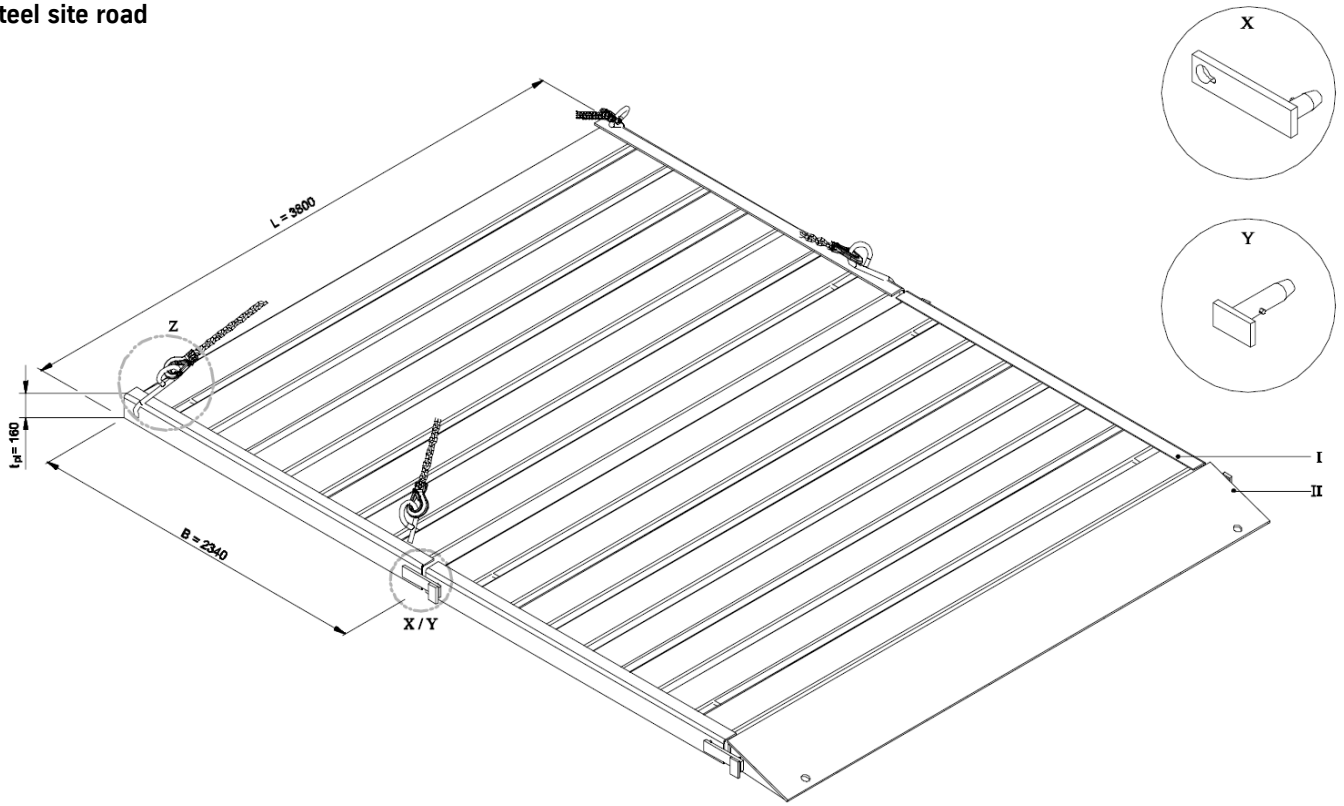
All safety-related dimensions conform with German safety and accident prevention regulations and German standards. The respective state-specific regulations are to be checked and applied before the works start.

Contents

1	System overview	2
2	Occupational safety and general notes	3
2.1	Symbols used in these instructions for use	3
2.2	Threats.....	4
2.3	General safety instructions and measures to reduce hazards	4
2.4	Protection against load fall and falling parts	4
2.5	Storage, transport and lifting operations.....	5
2.6	Criteria for inspection, maintenance and rejection of worn or damaged components	6
2.7	Applicable regulations	6
2.8	Personal protective equipment.....	6
2.9	Technical data of the elements.....	6
3	Assembly instructions	7

1 System overview

Steel site road



(All dimensions in mm)

- I Steel site road element
- II Access ramp
- III Connector
- IV Locking bolt
- V Lifting accessory
- VI S-hook

Length	2,340 mm
Width	3,800 mm
Height	160 mm
Weight	869 kg
Surface	8.89 m ²
Load	12 t axial load

2 Occupational safety and general notes

2.1 Symbols used in these instructions for use

Safety instructions

The following occupational safety symbols are located next to all occupational safety instructions that indicate a danger to life and limb of persons and are identified by a pictogram, a signal word and a signal colour.

The documentation explains the danger situations at the relevant points.

Observe these notes!

Observe the locally applicable safety and accident prevention regulations!

All the following dimensions conform with German safety regulations.

DANGER



Type and source of the danger

This symbol warns of a direct danger to the life and health of persons.

Non-observance of these instructions will result in serious health effects up to life-threatening injuries and extensive damage to property.

Action that must be omitted to prevent the danger from occurring.

WARNING



Type and source of the danger

This symbol warns of an imminent danger to the life and health of persons as well as damage to the environment and property.

Non-observance of these instructions can result in serious health effects up to life-threatening injuries or extensive damage to the environment and property.

Action that must be omitted to prevent the danger from occurring.

CAUTION



Type and source of the danger

This symbol warns of an imminent danger to the health of persons as well as damage to the environment and property.

Non-observance of these instructions can result in medium or slight health effects up to injury or extensive damage to the environment and property.

Action that must be omitted to prevent the danger from occurring.

NOTICE



Type and source of the damage to machinery and equipment

This symbol warns of a dangerous situation and is used to indicate a notice on how to handle the steel site road.

Failure to observe these notices can lead to extensive damage to property.

Action that must be omitted to prevent damage from occurring.

Tips and recommendations



This symbol highlights useful tips and recommendations as well as information for efficient and trouble-free operation. Action that must be omitted to prevent the danger from occurring.

Other markings

The following markings are used in this manual to highlight instructions, results, listings, references and other elements:

Marking	Explanation
1., 2., 3. ...	Step-by-step instructions for action
	Action results
	Lists without fixed order

2.2 Threats

When working with the steel site road, during loading and unloading, and when laying the panels, the following hazards exist, among others, with possible serious injuries or fatal consequences:

- Injuries due to suspended/swivelling loads
- Stumbling, slipping, falling
- Being hit by falling parts
- Crushing of hands and feet during loading and unloading, transport, assembly and disassembly and when laying out the panels

2.3 General safety instructions and measures to reduce hazards

We would like to point out that before assembly and disassembly of the panels, a corresponding risk assessment for the above-mentioned work steps must be prepared.

It is imperative that the technical information and the safety notices in these use instructions are followed.

DANGER



Danger to life or risk of injury due to inadequate protection of the construction site and neighbouring facilities/trades!

Inadequate protection of the construction site may result in serious or fatal injuries.

- Damage to buildings, vehicles, objects and persons located in the work area must be prevented by appropriate measures (e.g. sufficient safety distances).
- The panels are **not** suitable for bridging trenches, large differences in height or large holes.
- The use instructions must be available at the construction site.
- The construction road must be laid out by qualified personnel.
- The stability of the transport and laying machines must be ensured.
- The accessories, in particular the load carrying and/or slinging equipment, as well as the corresponding attachment points must be checked for damage and defects before work is started. Work may only begin when all defects have been eliminated.
- If the panels are laid by means of a forklift truck, the conditions on site must be checked in particular; especially a stable, level surface must be ensured.
- Ensure traffic safety if panels are laid in the area of public road traffic or if the laying has an impact on road traffic. Consult with the competent authorities.
- Two persons are always required to lay the panels.

2.4 Protection against load fall and falling parts

DANGER



Danger to life or risk of injury due to persons or parts falling down!

Persons or parts falling down may cause danger to life or risk of injury as well as damage to property! The following measures must be implemented depending on the construction site:

- Sufficient protection of the working area.
- The panels are to be fastened with an approved and tested 4-strand chain hanger. Make sure that the hook safety catch is intact. The length of the chain hanger should be selected so that the bracket is in the permitted area (between 45° and 60°).
- When laying the panels with a forklift, you need an additional load suspension device (crossbeam or similar) which is to be secured to the forklift. The chain hanger is to be attached to the load hook of the load handling attachment.
- The panels should be kept as close to the ground as possible.
- Before the disassembly of the panels, the top side must be cleaned properly.
- When disassembling the panels, materials adhering to the underside may come loose and fall off during the lifting and swivelling process.

- When laying the steel site road, the minimum distances (protective areas) around the upper edge of the pit or trench must be observed.
- Falling down of the panels during the lifting process must be prevented by properly inserting the slings.
- Care must be taken to ensure that the panels are free of falling materials (tools, screws, connectors, etc.) during lifting and swivelling.
- Do not step under suspended loads.

2.5 Storage, transport and lifting operations

Storage

DANGER



Danger to life or risk of injury due to incorrect storage!

Incorrect storage may result in danger to life or risk of injury as well as damage to property.

- The panels may only be stored on firm and level ground.
- The prescribed safety distances to pit and trench walls must be strictly observed during storage.
- The load-bearing capacity of the underground must be ensured before storage.
- The panels may only be stacked neatly in a maximum of 8 stacks of 5 panels each after having been cleaned. Between the stacks of 5 panels, 3 squared timbers (10 cm x 10 cm) must be placed underneath each of them at intervals of one third.

Transport and lifting operations

DANGER



Danger to life or risk of injury due to suspended loads!

During lifting operations, loads may swing out and fall down. There is danger to life or risk of injury and damage to property.

- Cranes or hydraulic excavators should preferably be used for transport/laying in hoist mode; when transporting with forklift trucks, it must be taken into account that the ground in the construction site area is often uneven. This can lead to the load slipping or falling - additional safety measures may be necessary when transporting with forklift trucks.
- The panels must be cleaned before transport.
- Transport damage must be reported to the manufacturer immediately.
- When laying the panels with a forklift, you need an additional load suspension device (crossbeam or similar) which is to be secured to the forklift.
- Hydraulic excavators in hoist operation must be equipped with an overload warning device and line breakage protection; the overload warning device must be switched on in hoist operation.
- Lifting gear, load handling devices and slings must be selected according to the load.
- All lifting gear, load stops and load handling devices must be approved and tested.
- Only load hooks with a safety latch must be used to prevent the load from unintentionally unhooking when lifting, pulling or transporting.
- The panels may only be attached and transported at the designated attachment points.
- Pendulum movements during transport must be reduced to a minimum.
- Transport must be carried out as close to the ground as possible.
- Never pass the lifted load over persons.
- Attached loads are to be guided with guide ropes/guiding rods; always walk behind the load and do not walk backwards.
- Accompanying persons for guiding the load and lifting gear must always be inside of the machine operator's field of vision and outside of the travel path or danger zone.
- Accompanying persons for guiding the load and lifting gear must have a safe standing position; never stand between a suspended load and a fixed abutment (danger of crushing!).
- Always ensure that fingers and feet are free when lifting, guiding and setting down the load; never guide loads by the sling gear.
- Unauthorized persons must be prevented from entering the working and swivel area (danger zone). If necessary, the transport and loading area must be shut-off or secured by a security guard.

2.6 Criteria for inspection, maintenance and rejection of worn or damaged components

- The panels are subject to a functional test and visual inspection by the supervisor prior to each use. Attention must be paid to conspicuous defects such as fractures, defective attachment points and gross damage.
- If defects are found that might reduce the load-bearing capacity, especially damaged attachment points, the panels may only be reused after they have been properly repaired.
- Defective or missing parts must be exchanged, repaired or replaced before use.
- Only original parts from the manufacturer are to be used.
- The manufacturer does not grant any warranty for any repairs carried out independently and when using parts that are not original parts.
- In case of any doubts about the usability of the panels, in case of defects and damages, the manufacturer is to be contacted.

2.7 Applicable regulations

The applicable national rules and regulations must be observed and complied with.

2.8 Personal protective equipment

Personal protective equipment (PPE) is designed to protect people from adverse effects on safety and health at work.

Basically, the personal protective equipment required for the activities is the result of your risk assessment.

We recommend the following PPE for loading and unloading activities, assembly and disassembly, transport and lifting activities, maintenance and repair and cleaning:

2.9 Technical data of the elements

The technical data of the elements used can be found in the current version of the technical manual. The technical manual is available at www.terra-infrastructure.com

3 Assembly instructions

Before starting work, all the safety instructions in the chapter “Occupational safety and general information” must be observed (see section 2 on page 3)!

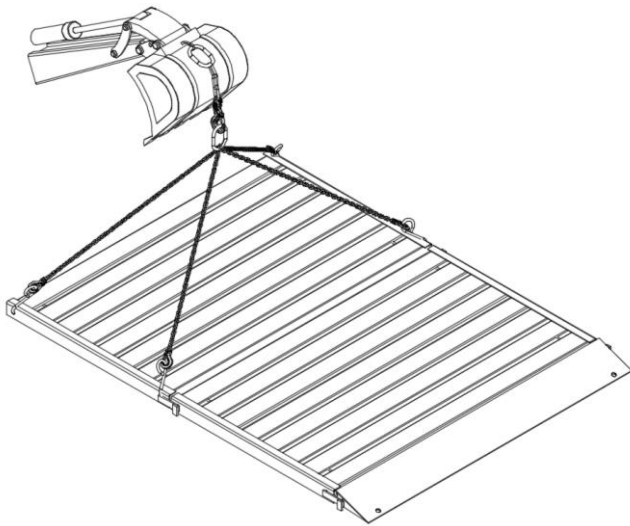
The steel site road elements can be unloaded either as a package or individually. 4-S hooks are supplied for package handling and to facilitate better handling on the construction site. A maximum of 6 elements may be lifted at the same time using these approved hooks.

Unloading and laying must be carried out using suitable lifting equipment. Adequately-sized wheel or track excavators are to be provided on site. You should always use all 4 eyelets to lift and transport the panels. Panels should be transported in a horizontal position.

1. Preparation

- Determine direction of installation using direction-finding poles or plumb lines
- If necessary, lay out geotextiles

2. Moving



Move using suitable lifting gear and sling (min. 13 mm 4-strand chain with a GS certification mark). The chain hanger to be provided by the customer is to be secured to the four suspension bolts on the top of the panel.

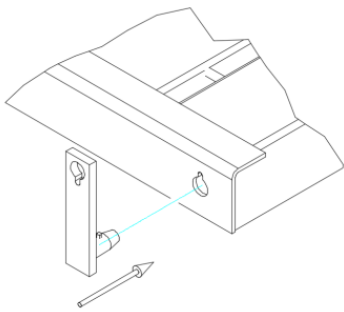
3. Positioning

Two panels are to be laid out one after the other with the short sides in the direction of travel and connected to each other and then lined up. Further laying is then carried out with continuous alternation between laying and connecting.

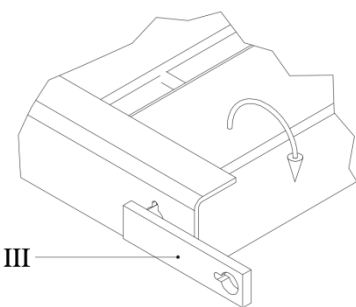
Access ramps must be coupled with connectors at the starting and final point of the site road in order to avoid damage.

4. Connecting

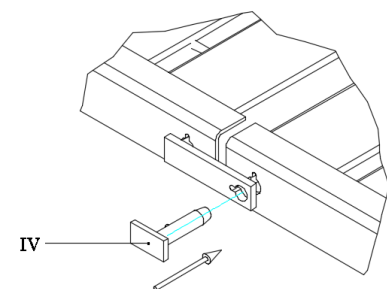
The panels are connected to each other using connectors and locking bolts.



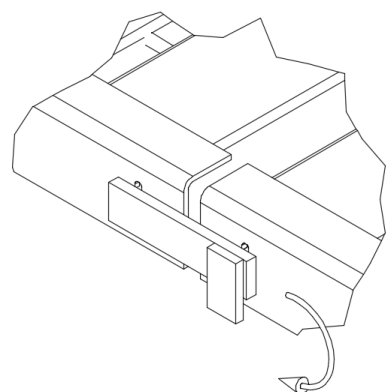
Insert connector vertically into the element already placed



Turn connector 90°



Line up the next element using lifting equipment and locking bolts through the opening of the connector, then insert into the steel site road element. Only then the element can finally be put down

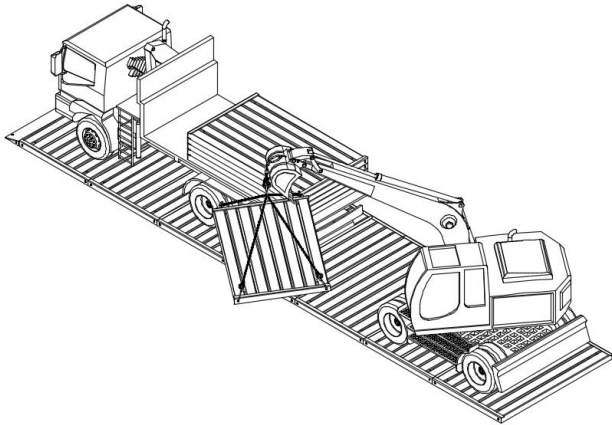


To secure the locking bolts, turn them 180°. The long end of the locking bolt must be vertical and facing downwards.

5. Laying out in a curve

To create a curve, the panels in the outer bend should be locked in place with two connecting pieces and a locking bolt. This will result in a curve radius of approx. 40 m.

6. Driving



The steel site road can continue to be placed and can be used by vehicles after it has been secured.

7. Dismantling and cleaning

For dismantling and separating the panel elements, the panels may only be lifted from the hoisting points on the top end which have been provided for this purpose (round bolts, upper edge of the panel).

Digging the panels out with an excavator bucket will result in damage and should be avoided.

Residual earth is to be cleaned from the bottom of the panels by striking them on the ground (in the 4-strand chain hanger) multiple times. We recommend using geotextiles to keep the dirt on the panels to a minimum. Residual dirt in the lane recesses on the upper side of the panels is to be removed in a similar way in the 2-strand chain hanger.

Dirty panels weigh more and may result in higher return transport costs. This should be taken into account during the loading process.

Statutory provisions for standing beneath suspended loads and accident prevention regulations shall apply.

terra infrastructure

terra infrastructure GmbH
Hollestraße 7a
45127 Essen, Germany
P: +49 201 844 - 562313
F: +49 201 844 - 562333
info@terra-infrastructure.com
www.terra-infrastructure.com

Trench Shoring

terra infrastructure GmbH
Ottostr. 30
41836 Hückelhoven, Germany
P: +49 2433 453-0
F: +49 2433 453-100
trenchshoring@terra-infrastructure.com