

ISOTRACK **H**OVERLAP
PROTECT – BE SAFE

USER MANUAL



ISOKON
INNOVATIVE PLASTICS SOLUTIONS

ISOTRACK

PROTECT – BE SAFE



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Isotrack H-Overlap User Manual
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IMPORTANT NOTICE

This manual provides best practice guidance to help those involved in handling and installing Isotrack H-Overlap mats for temporary roadway and ground protection purposes.

Health and Safety should always be top priority. Therefore, this user and guidance document should be read in conjunction with Health and Safety project site requirements.

Please also refer to Isokon's Standard Terms & Conditions and Warranty.

1. ISOTRACK H-OVERLAP - INTRODUCTION

The Isotrack H-Overlap Composite Mat System (hereafter referred to as H_{OI}) provides a safe, cost-effective temporary road and ground protection surface for heavy duty applications. The mats are made of thermoplastic material for a strong, durable, working surface that can be used for projects that require safe temporary access for heavy vehicles, operating equipment and site personnel over soft or sensitive ground.

The mats are easy to handle and install as tracks, roadways, working pad and parking areas using a simple connection system. The surface tread patterns provide non-slip traction for vehicles, work crews and pedestrians. Subject to recommended use and maintenance the mats will provide long-life performance.

The mats can be used on a wide range of project types:

- Construction and civil engineering
- Utilities
- Oil and gas
- Mining
- Transmission
- Drilling contracts
- Events
- Temporary road and work areas
- Emergency access
- Hard and soft landscaping work
- Sports facilities and recreational grounds
- Heritage and environmental sites
- Any project requiring safe temporary access for vehicles, equipment and personnel



Figure 1: Equipment on Isotrack H-Overlap

2. ISOTRACK H-OVERLAP – KEY FEATURES

2.1 Key Features

The Isotrack H_{ol} mat is 3.0m x 2.5m x 38mm core thickness (46 mm thickness including surface structure) and weights approximately 265kg.

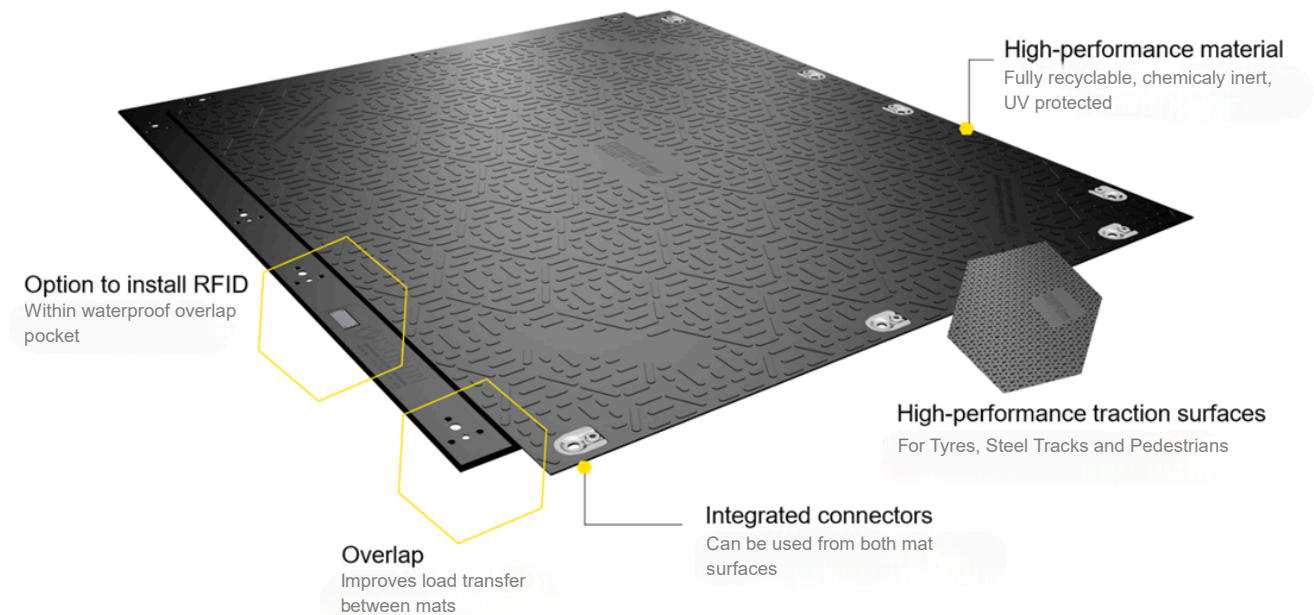


Figure 2a: IsoTraction Surface for Rubber Tyre Vehicles



Figure 2b: Surface for Steel Tracked Vehicles

- Two surface traction designs—one for steel tracked vehicles and one (IsoTraction) for rubber-tyred vehicles. Both surfaces can be used for pedestrian access and movement.
- IsoTraction surface design is based on major tyre manufacturer traction research and has been independently tested to demonstrate superior grip for vehicles compared to other mats.
- Overlap system ensures good load transfer between mats.
- Both brickwork (offset) and orthogonal assembly options possible.
- Innovative patented exchangeable nut metal connectors.
- A number of raised nubs on the tyre surface have been designed to interlock with the steel traction surface to help prevent mats sliding over each other during transport.
- One-piece compression moulded high-performance thermoplastic material, resistant to chemicals and oil, UV protected, will not rot.
- Can be connected in different configurations to make roadways, pads, turning areas or passing places.
- High performance over a wide temperature range and operating conditions.
- Batch marking – quality control.
- RFID optional on request.
- Option for customer logo marking.

2.2 Isotrack H-Overlap Benefits

Isotrack H₀ provides many user benefits:

- Support vehicle and equipment operating weights up to > 200 tonnes depending on ground conditions [[Mat Application Guide - Isotrack](#)].
- Fast unloading, handling, deployment and installation using forklifts, telehandlers, vacuum lifting or, mechanical grab equipment.
- Fast and easy to install using M16 bolt and exchangeable nut connector.
- Mats gently flex with ground contours – no need for ground preparation.
- Can be used on a wide range of different ground conditions and soil types to prevent vehicles and site personnel getting bogged down.
- Safe movement and access for vehicles, equipment, and people.
- Prevent severe rutting and damage – avoid ground reinstatement costs.
- Keep your project running to avoid delays and downtime costs.
- Flexible but tough and durable mat for long life use.
- Cannot puncture and take on water or contaminants.
- Easy to clean after use.
- Low theft risk compared to aluminium and steel mats.
- Sustainable – made from HDPE material that is 100% recyclable at end of life.

3. ENVIRONMENTAL AND CORPORATE SUSTAINABILITY

Isotrack H_{oI} can be used to help protect the environment and support corporate sustainability objectives:

- Protecting the environment – the mats help to reduce ground damage and protect habitats.
- Supporting Health & Safety through safer movement of vehicles, equipment and project workers.
- Can contribute to accident rate reduction and downtime incidents.
- The materials used to make Isotrack H_{oI} are 100% recyclable at end of life.
- Mats manufactured using recycled materials have lower carbon footprint compared to mats manufactured using prime materials.



4. TRANSPORT, HANDLING, STORAGE, CLEANING & MAINTENANCE

At depots and on site it is essential that:

1. Personnel involved in the transport, handling, installation, storage, cleaning and maintenance of Isotrack H_{oI} should wear appropriate Personal Protective Equipment.
2. All Health and Safety requirements are complied with.

4.1 Transport

Isotrack H_{oI} leaves the factory for delivery strapped on pallets or four wood bearers of seven mats (gross weight including pallet = 1930kg). The mats can be un-strapped at a depot or on site before first use.

- It is good practice to ensure that mats are carefully stacked and aligned for transport.
- There are two approved safe methods for storing and handling H_{oI} mats:
 1. The first method is to secure up to seven mats strapped on a pallet (see Figure 4a).
 2. The second method is to secure up to seven mats supported on four timber bearers (see Figure 4b).
- The mats must be safely loaded/unloaded using appropriate equipment (e.g. forklift, crane) with the certified lifting and load capacity.
- As a general guide, it is recommended that a maximum of one pallet of seven strapped mats or one unstrapped mat is lifted at a time.
- Use appropriate straps or other fixing methods to safely secure the mats during lifting and transport.
- Ensure compliance with international, national, and regional road directives and regulations (in particular, maximum authorized dimensions and weights).

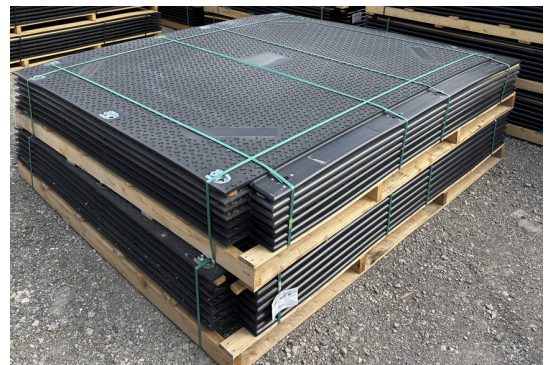


Figure 4a: Mats on pallets

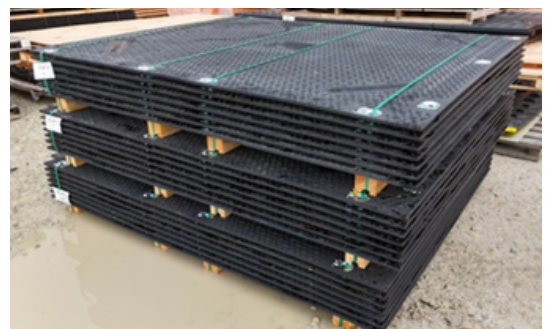


Figure 4b: Mats on wood bearers

4.2 Lifting and Handling

New mats are delivered from the factory on pallets or bearers supporting seven securely strapped mats. The straps can be removed after unloading at a depot or prior to first use on site. Pallets, bearers, strapping, and any other packaging should be disposed of responsibly.

The mats should be loaded / unloaded by fully trained personnel using the appropriate equipment for safe lifting and handling of the mats.

On site and in preparation for installation mats can be removed from pallets/bearers or from the back of a truck using suitable equipment e.g. tele-handlers / other equipment with extended forks (minimum 1.8m in length). Mats can be transported directly to place of installation. It is recommended that extended forks with rubber grips (see Figure 4c) are used to provide more traction with the pallet/wooden bearers.



Figure 4c: Extended forks with rubber grips

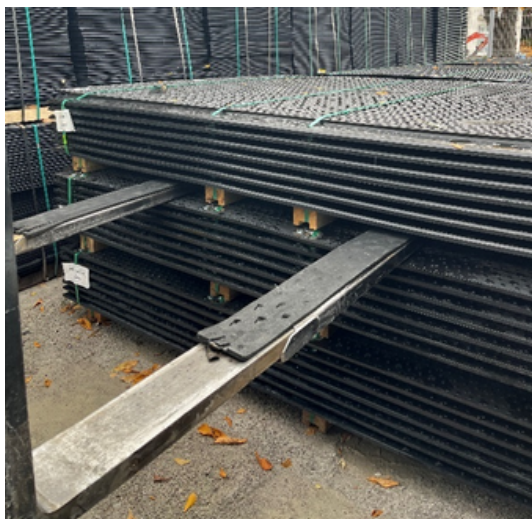


Figure 4d: Proper loading with rubber grips



Figure 4e: Proper way of transport



Figure 4f: Proper loading on a truck

4.3 Storage and Stacking

Mats can be stored on pallets/wooden bearers as delivered until used.

Mats can be stockpiled without pallets/wooden bearers after use – in the depot or safely secured on trucks used to transport the mats to site. It is recommended that mats should be stored in packs of seven (as standard for transport). The bottom mat can be placed on wooden bearers to position forks under the stack for lifting. Packs of mats should be separated using minimum of four 100 x 100 mm timbers spanning the full width of the mats (refer Figure 4g). This will ensure access to the stack using forks.

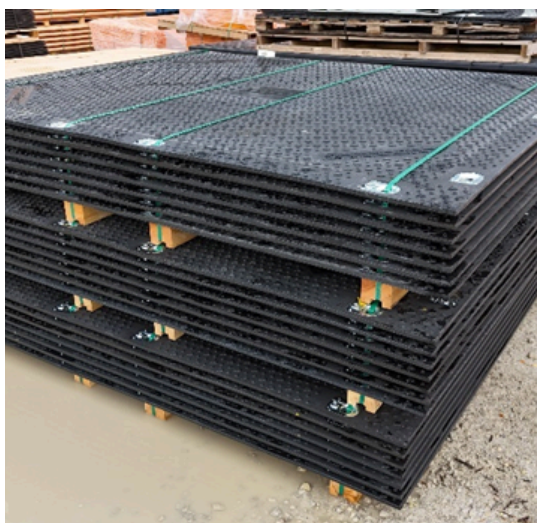


Figure 4g: Storage on wooden bearers



Figure 4h: Unloading of the mats

- When storing the mats, care should be taken to ensure that the ground is level and stable within the storage areas. Clear any obvious obstructions from the surface before stacking the mats.
- The number of pallets, or mats stacked on timber bearers, or individual mats that can be safely stacked on top of each other will depend on the size of the storage area, site safety requirements and the equipment available for lifting and moving the mats.



Figure 4i: Loading on a truck

Should, after a prolonged period of use on a site with undulating ground, the mats show slight deformation / conformance to any ground irregularities they should be stored upside down on a flat surface at the end of the job – due to the material properties the mats will return to their original flat shape (this will happen faster in warmer conditions).



Figure 4j: Proper way of loaded mats on a truck

4.4 Cleaning

Isotrack H_o/ mats are made with a thermoplastic material which does not absorb any contaminants into its structure and provides an effective barrier between the ground and mat surface.

On Site:

1. It may sometimes be necessary to clean mats / bolts on site – before being re-used elsewhere on the same project or before loading for return to depot. This can be undertaken using water hoses, pressure washers or brush cleaning equipment.
2. Oil, fuel or other contaminants should be removed, contained and isolated for safe disposal in full compliance with statutory and site-specific pollution prevention and waste management plans.

Back at the depot and in preparation for the next project:

1. The mats/bolts can be steam or pressure washed to remove dirt and mud and to restore optimal traction and connection.
2. Any residual oil, fuel or other contaminants should be contained and isolated for safe disposal in accordance with statutory and site-specific pollution prevention and waste management plans.



Figure 4k: H-overlap mat in muddy conditions

4.5 Removing Snow and Ice

Mat surfaces may sometimes require removal of snow or ice. The material used to make the mats can be damaged by steel equipment so where possible removal should be undertaken by sweeping using vehicles with stiff brush attachments. If necessary, vehicles with snow shovel or plough equipment can be used although extreme care must be taken to avoid damage to the mat surfaces and the heads of connection bolts. Where possible use equipment having a sacrificial/flexible edge made of UHMWPE or heavy-duty rubber to prevent gouging. Risk of damage will be greater if mats are unevenly installed or not properly connected.

The mats will not be damaged by using salt or sand, so these can be safely used to prevent slip risk from ice, snow, vehicle oils etc. However, as always, such use must comply with statutory and site-specific pollution prevention requirements.

4.6 Maintenance

The Isotrack H₀/mat is designed to be relatively maintenance free. However, if mats are mishandled or used in ways for which they were not designed then they can get damaged. Periodic inspections on site and / or in the depot should be undertaken by a competent person to look for:

- Cracks within the mat surface. If it is only a minor crack, then the mat may be able to continue to be used. If a large crack, multiple cracks or breaks occur then it is advisable to replace the mat as soon as possible.
- Missing connection bolts or parts - the bolts are part of the standard connection system and are designed to securely hold adjacent mats together. Continued use with missing bolts could adversely affect mat performance. Any other missing components should be replaced as soon as possible.
- If, due to misuse, the exchangeable nut gets severely damaged, then a mat should be returned to the depot for installations of a new nut (refer to Appendix 3).
- Loose connection – if it is obvious that a connection bolt is working loose then it should be tightened.

5. SITE ANALYSIS AND PREPARATION

It is expected that Isotrack H_o will be used only where it is able to safely meet site and project conditions as understood by project site managers and their geo-technical engineers. The contractor or site project manager is responsible for understanding all site conditions and risks including location and depth of any underground utilities (particularly important if using U-pin connectors). Detailed installation recommendations and theoretical performance data are provided in the Isotrack mat application guide: [Mat Application Guide - Isotrack](#).

Careful consideration needs to be given to:

- Current and expected ground conditions along the routes and areas where Isotrack H_o is to be used including ground-bearing capacity. Ground conditions and bearing capacity can significantly change, for example, in response to periods of rainfall and flooding.
- The duration of the project and the types, sizes and weights of vehicles and equipment to be used.
- For large projects it is good practice to use scaled site drawings to show the alignments and numbers of mats required to complete the temporary road and pad areas required.
- Isotrack H_o mats are flexible allowing them to contour to an undulating ground surface - small ground irregularities will not adversely impact on mat performance. However, it is important to note that the mats are not designed to be used for bridging over ditches or trenches - some grading or infilling of the ground surface prior to installation may be required.
- Site survey along the routes and areas where Isotrack H_o is to be used. This is to identify where boulders, shrubs, tree routes, stumps or other obstructions may need to be cleared or managed ahead of mat installation.



Figure 5: Isotrack mats conform to minor ground undulations while maintaining continuous ground support

6. DEPLOYMENT AND INSTALLATION

6.1 Lifting Equipment

Pallets of mats or mats on wooden bearers can be handled on site using different types of equipment if they are fit for purpose and meet site health and safety requirements.

Typically, pallets of mats are lifted from trucks and/or taken to the installation area using equipment fitted with forks, but mats can also be lifted and handled using vacuum lifting equipment or special grabs.

- Pallets of mats should only be handled by adequately trained and experienced operators.
- Pallets should be picked up by forks on the long side.



Figure 6a: Correct way of lifting the pallets

6.2 Installation Tools

The M16 bolts supplied with the connectors can be tightened using a standard combination, socket, or ring spanner, or a power tool.

Important – maximum torque of 20Nm to tighten the bolt should not be exceeded.

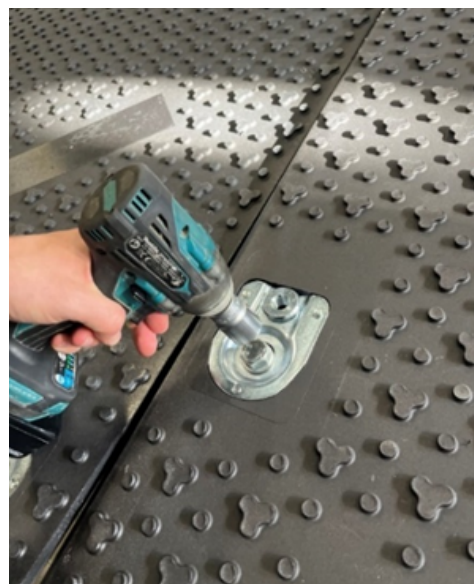


Figure 6b: Power tool for tightening

6.3 Installation of Isotrack H-Overlap

Each standard Isotrack H_omat has total of 14 exchangeable nut connectors (three on each short side and four on each long side). This provides options for installation configuration. For safe installation mats must **ALWAYS** be connected. For temporary road/tracks it is recommended that all connector points are secured.

Connection procedure and connection system using a mechanical grab:

1. The first mat is positioned on the ground. The underlap of the first mat must face the direction of the roadway to be connected (see Figure 6c)

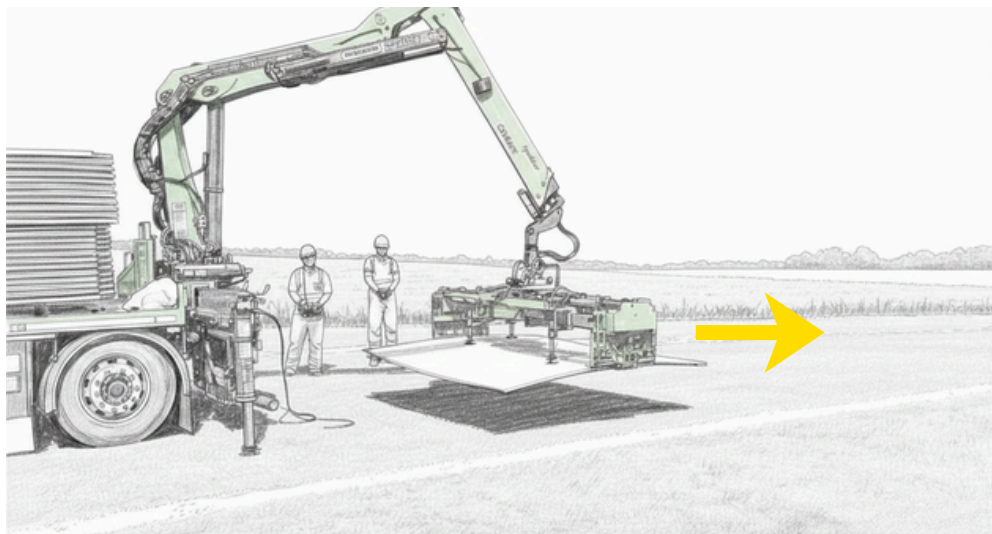


Figure 6c: Underlap must be oriented by the yellow arrow

2. The next mat should be installed on the overlap of the previous mat

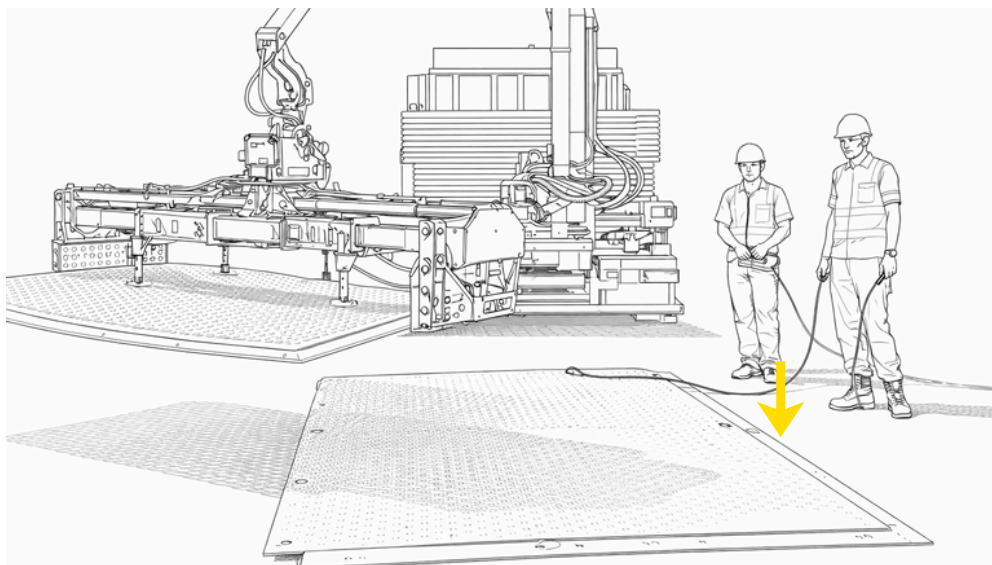


Figure 6d: Underlap on which overlap on a next mat should be assembled

3. The installation tool can be used to align the connection holes

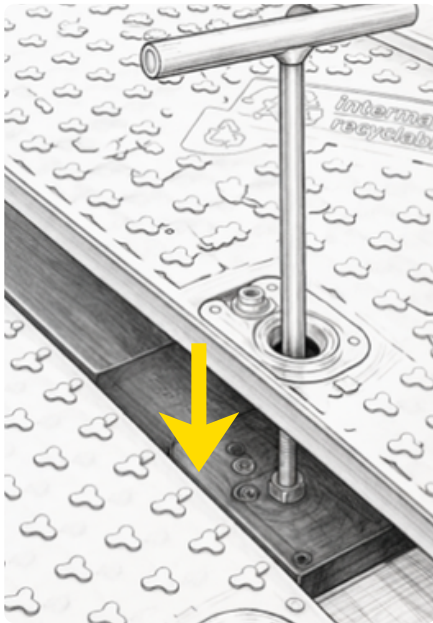


Figure 6e: Insert the installation tool in the fitting hole

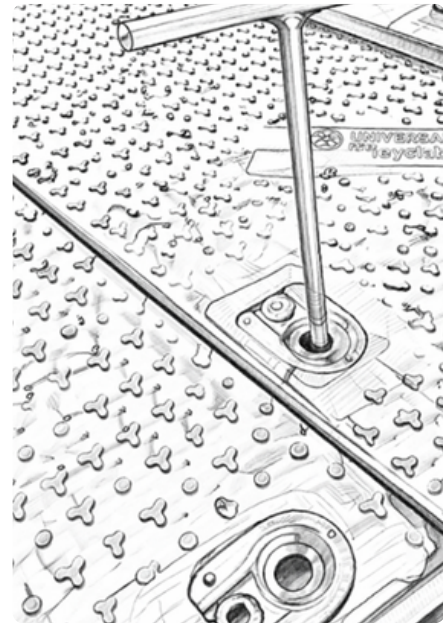


Figure 6f: Lower the mat on a proper position

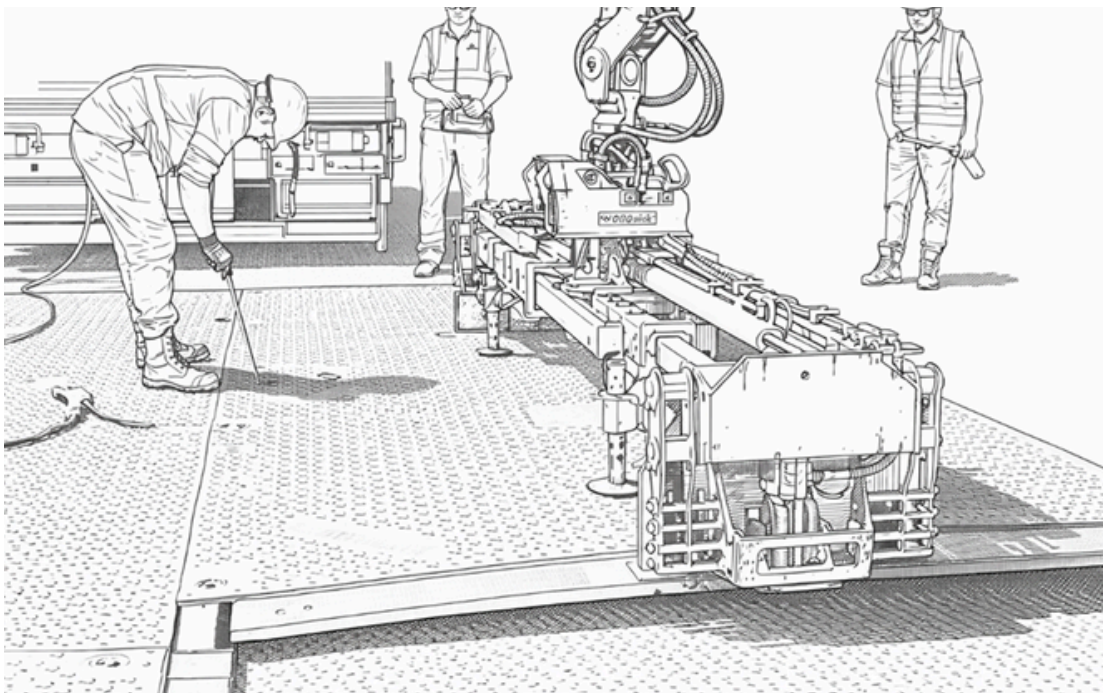


Figure 6g: Aligning process of the installation

4. Two mats should be aligned (also the holes of connectors) as seen in the picture below

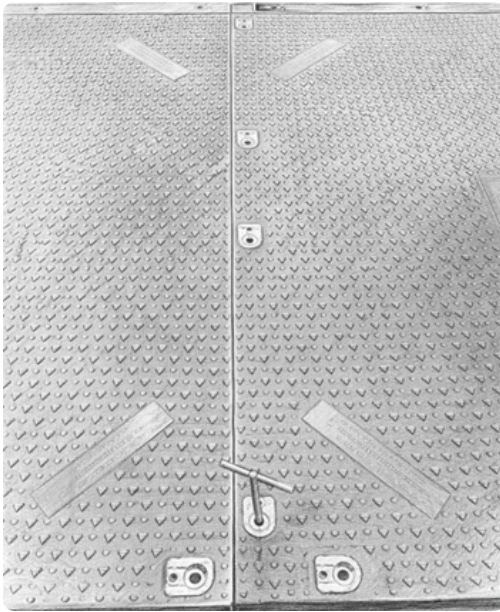


Figure 6h: Aligned mats during installation

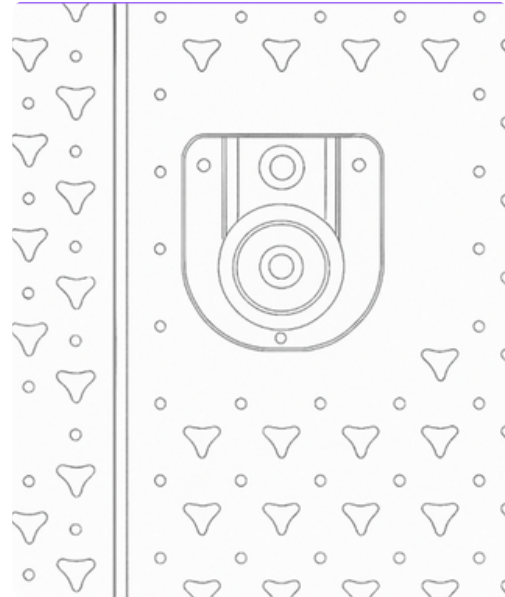


Figure 6i: Proper alignment of connector holes

5. The bolt with washer is inserted and first screwed hand tight

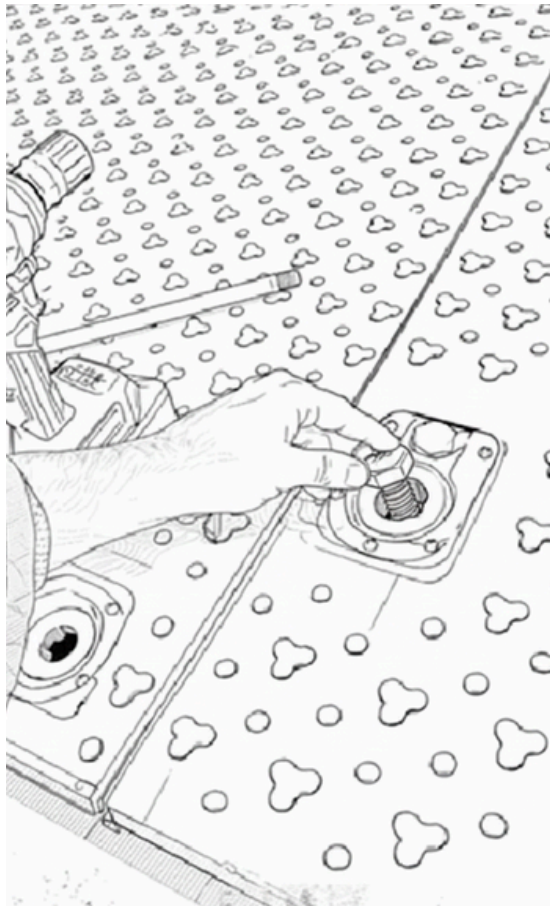


Figure 6j: Tightening a bolt by hand

6. When all bolts have been tightened by hand, they can then be fastened using the power tool, socket or ring spanner

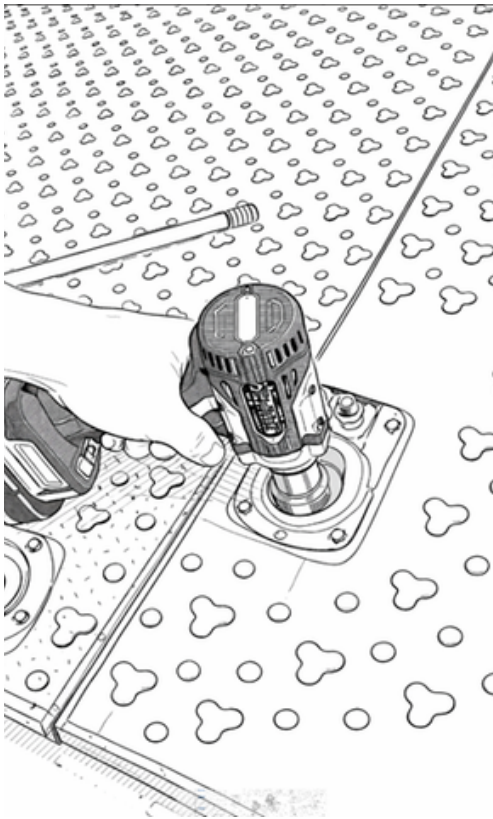


Figure 6k: Tightening a bolt by power tool

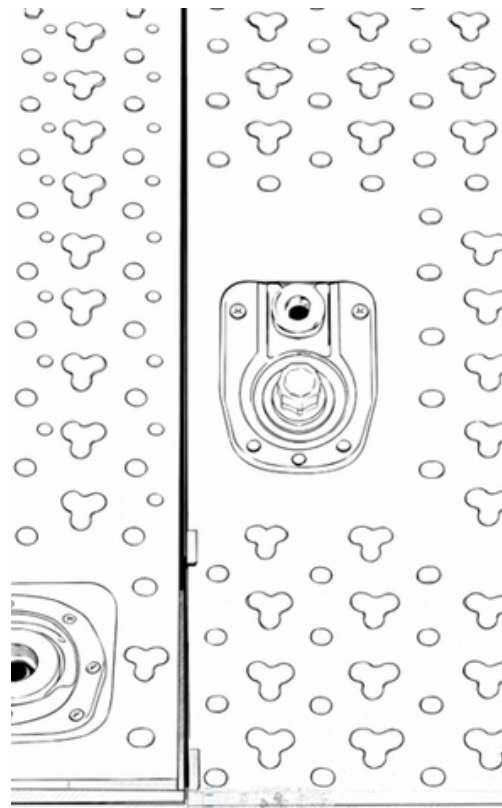


Figure 6l: Properly tightened bolt in connector



Figure 6m: Tightening a bolt on a terrain

7. All other bolts should be inserted and fastened as described in steps 5 and 6

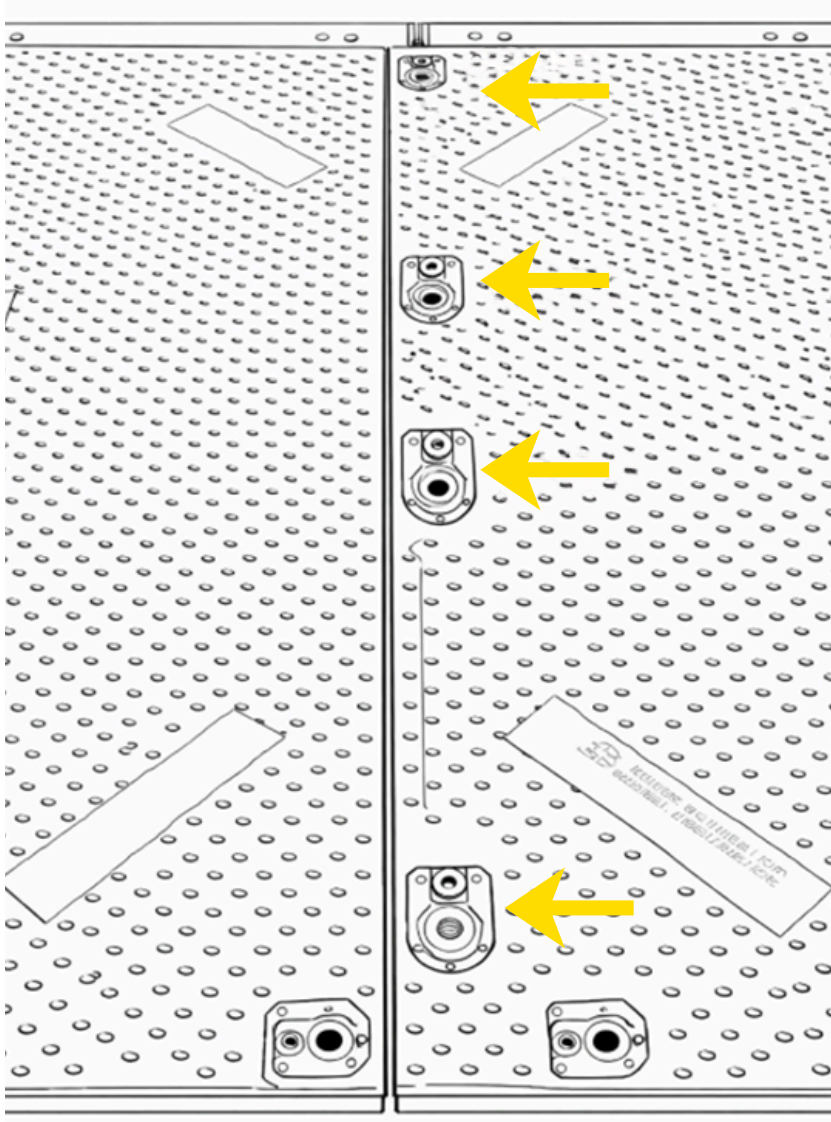


Figure 6n: Positions of the connectors which needs to be fastened

Connection

Where mats are installed on reasonably level ground the unique integrated exchangeable connector in each overlap of the mat must be used. The two connectors together are fastened with M16 bolts.

Important –maximum torque of 20Nm to tighten the bolt should not be exceeded.



Figure 6o: Properly inserted and fastened bolts

6.4 Manipulation options

For lifting the H_{oI} mat different methods can be used

Hydraulic Grab

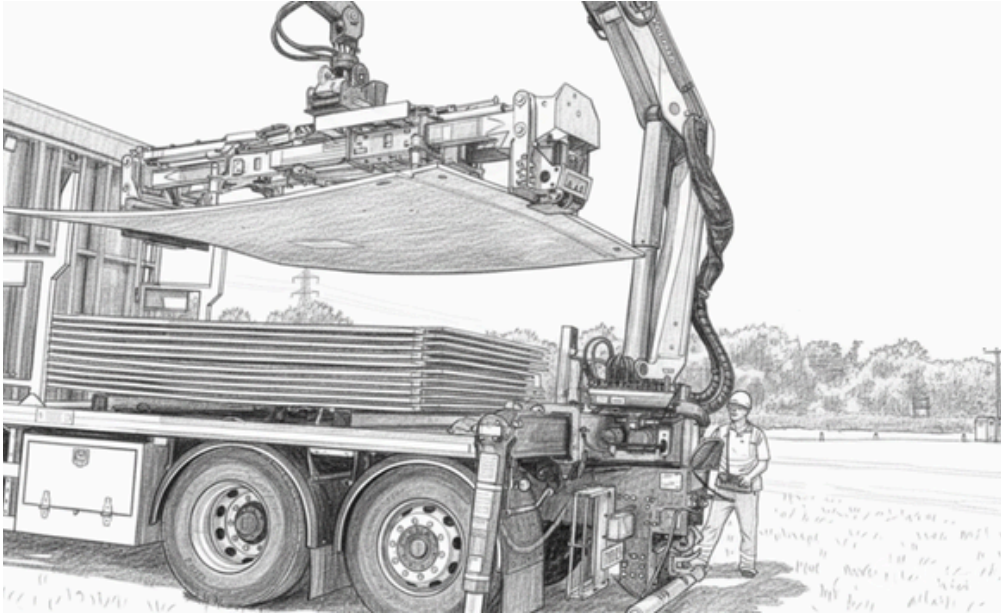


Figure 6p: Using Hydraulic Grab on terrain

Vacuum Lifting Equipment

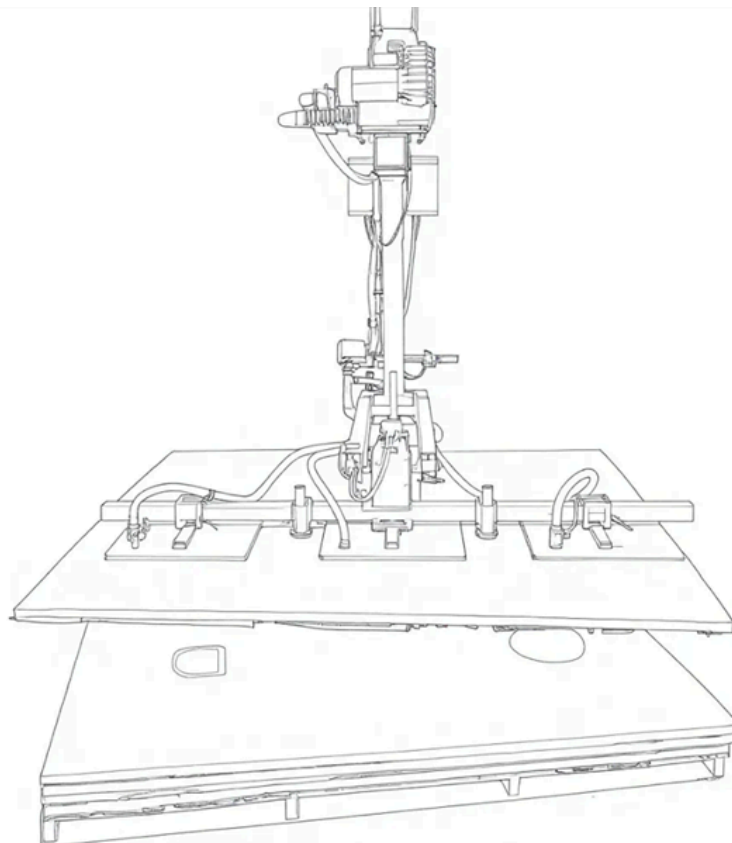


Figure 6r: Using Vacuum Lifting Equipment on terrain

6.5 Removing Isotrack H-Overlap mats

The Isotrack H_{ol} mats should be removed in the reverse sequence to that used for installation:

1. Unfasten and remove the M16 bolts to separate adjacent mats. Bolts and washers should be stored for future use.
2. Mats should be lifted and stacked on pallets or timber bearers (to be strapped) or loaded onto trucks and securely strapped for safe transport to the next project or return to the depot.
3. Suitable equipment (see Section 6.4) should be used to lift the mats for stacking and storage - as shown in sections 4.2 and 4.3.
4. Appropriate equipment must always be used to ensure safe lifting and handling of the mats.

6.6 Using Geotextiles

On sites that are particularly wet or muddy it is recommended that a geotextile material is first rolled out over the ground before mat installation commences. Geotextile can provide a cost-effective barrier between the mats and the ground preventing water and mud being pumped up onto the mat surface. In turn this reduces the need for cleaning mat surfaces during (and after) the project and provides a safer working surface.



Figure 6s: Using Geotextiles on the field

7. OPERATING GUIDANCE AND LIMITATIONS

7.1 Safe Speed

Isotrack H₀/ mats have been designed for the safe movement of worksite vehicles, equipment and personnel. Although the mats will provide temporary roadway access it is important to understand that the mats will not behave in the same way as a permanent road surface. It is therefore necessary to observe strict control over the speed of vehicles using the mat system. Subject to project site safety requirements it is recommended that vehicles and equipment **should not exceed 10 kph**.

7.2 Bridging

The mats will flex to ground contours and small gaps beneath the mat will not affect performance. However, Isotrack H₀/ mats are not designed for bridging or spanning trenches. The mats are intended to be used so that they are mostly in contact with the ground. In areas where mats are to span significant ground depressions some minor re-grading of the ground surface prior to installation is required – a more uniform surface will facilitate speed of installation and improve transfer of vehicle load across the mats.

7.3 Steel-Trackled Vehicles and Equipment

The Isotrack H₀/ mat is designed with a surface suitable for use with steel-tracked vehicles. This surface helps to reduce the risk of damage to the mat during operation.

Steel-tracked vehicles may be used on the mats, if they are operated with due care. Operators should avoid sudden movements, excessive turning in place, or other actions that may cause unnecessary wear or damage to the mat surface.



Figure 7a: Caterpielar on Steel side of the mat

7.4 Steps for proper use

1. Ensure that the mats are installed with the 'steel tracks' surface uppermost



Figure 7b: Steel track symbol

2. Plan for the movement of steel-tracked vehicles – it is better to have the vehicles moving forwards and backwards in straight lines within the area that they need to work.
3. If turning areas are required, then turning movements should be undertaken at very slow speed to minimise the risk of damage to the mat surface.
4. Inspect for significant damage as soon as the steel tracks are used. Minor surface damage is to be expected. However, should gouge marks into the mat core be evident then vehicle speed and/or mode of operation should be addressed to prevent any further significant damage.

7.5 Using U-pins

To fix the position of mats that are installed on sloping ground or are at risk of excessive movement due to the use of heavy vehicles and equipment, straight or U-pins or other suitable types of fixing pins.



Figure 7c: U-pin

How to use U-pin properly

1. Put the U-Pin in open hole (without the exchangeable nut) as seen in the photo below



Figure 7d: Position the U-pin in the proper hole

2. Use a hammer to drive the pin in the depth



Figure 7e: Hammer the U-pin into the ground



Figure 7f: If different side of the overlap is used, then use the hole seen in the photo above.

Disassembly of U-pins

When removing the U-pins, simply pull them out in the opposite direction of installation. We strongly recommend using a crowbar.

Important warning before using pins

- Check with site manager / supervisor about the location and depth of any services or utilities on site.
- Check all relevant services / utility plans.
- Look for external signs of the presence of services.

Appendix 1 – Mat Drawings

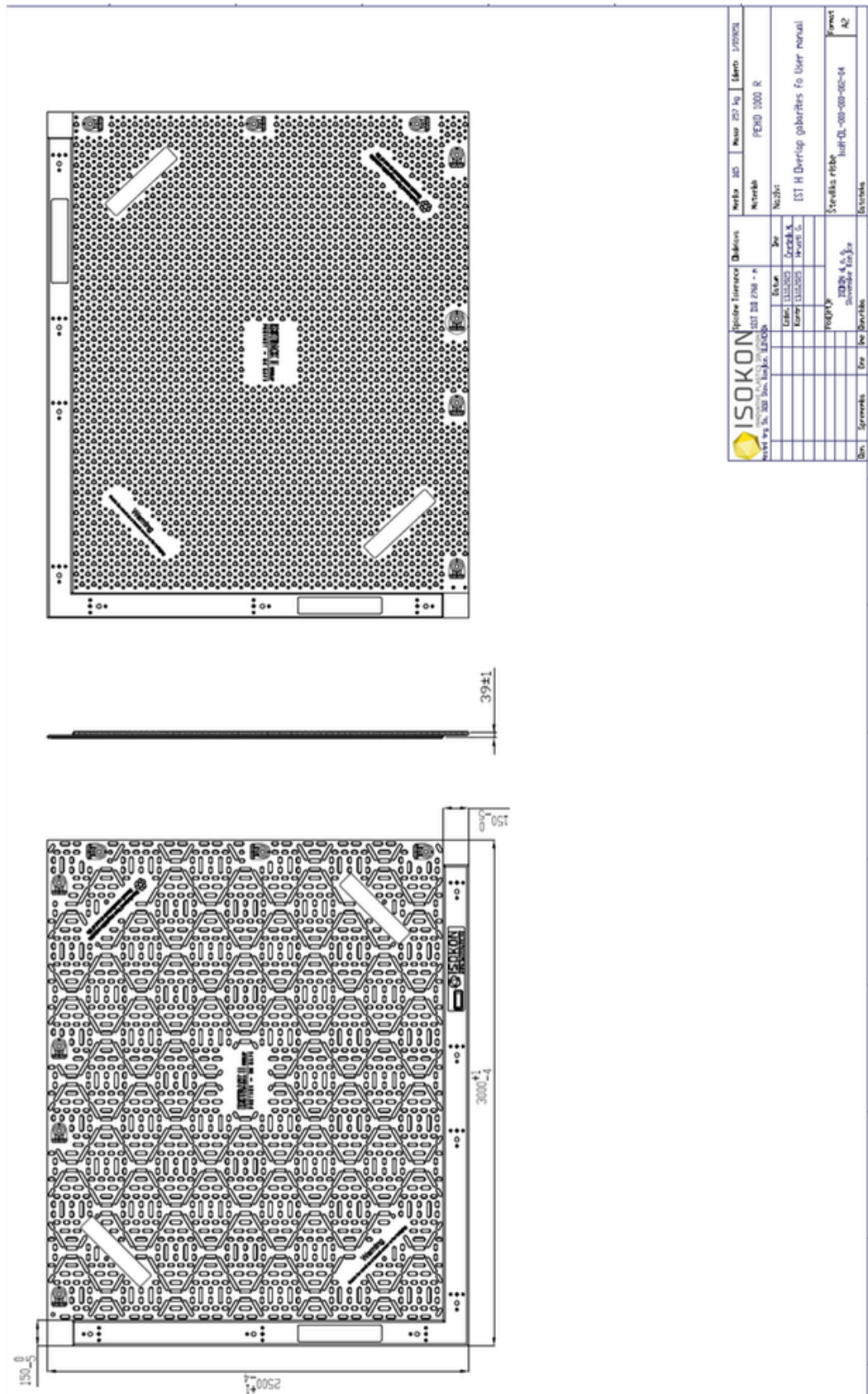


Figure Appendix 1: Documentation of H-Overlap mat

Appendix 2 – Mat Configuration Options

Single Track

The single track (2850 mm running road width option as seen in Figure Appendix 2a) is formed by installing the mats long side to long side in the direction of the road. A minimum of two corner connectors is required.

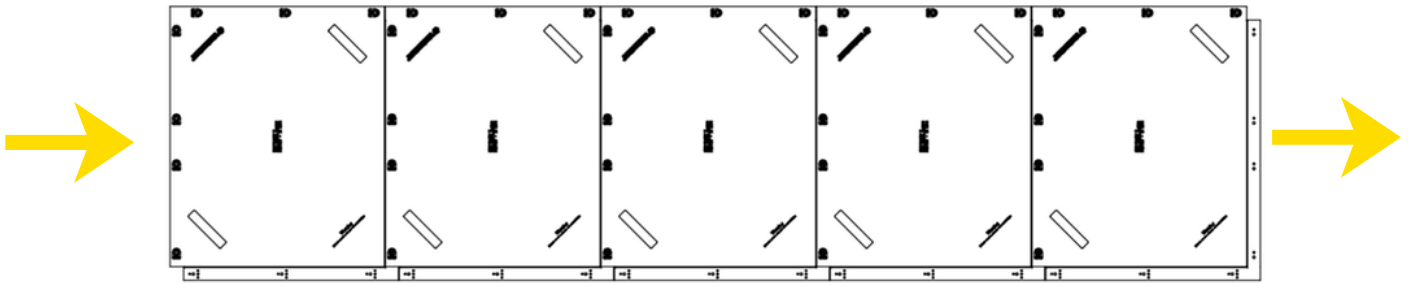


Figure Appendix 2a: Installing the mats long side to long side

The single track (2350 mm running road width option as seen in Figure Appendix 2b) is formed by installing the mats short side to short side in the direction of the road. A minimum of two corner connectors is required.

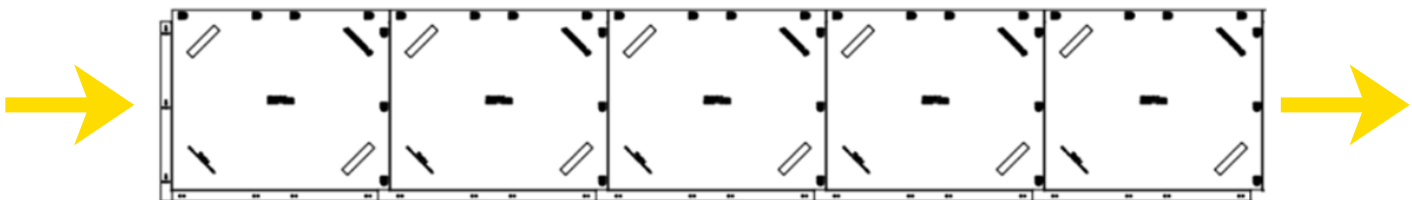


Figure Appendix 2b: Installing the mats short side to short side

Double Track and turning areas

Isotrack H₀₁ mats can be installed and fastened together to cover large surface areas to be used as work sites or pads. Once the required area has been calculated installation commences and follows the sequence as shown below. Begin by laying one mat at the outside corner of the proposed site, nearest to the access road. The mat should be aligned with the edge of the site so that the pad, when constructed, covers the required area. By laying the mats from the corner outward, you will be able to work on the matted surface and have more room to manoeuvre.

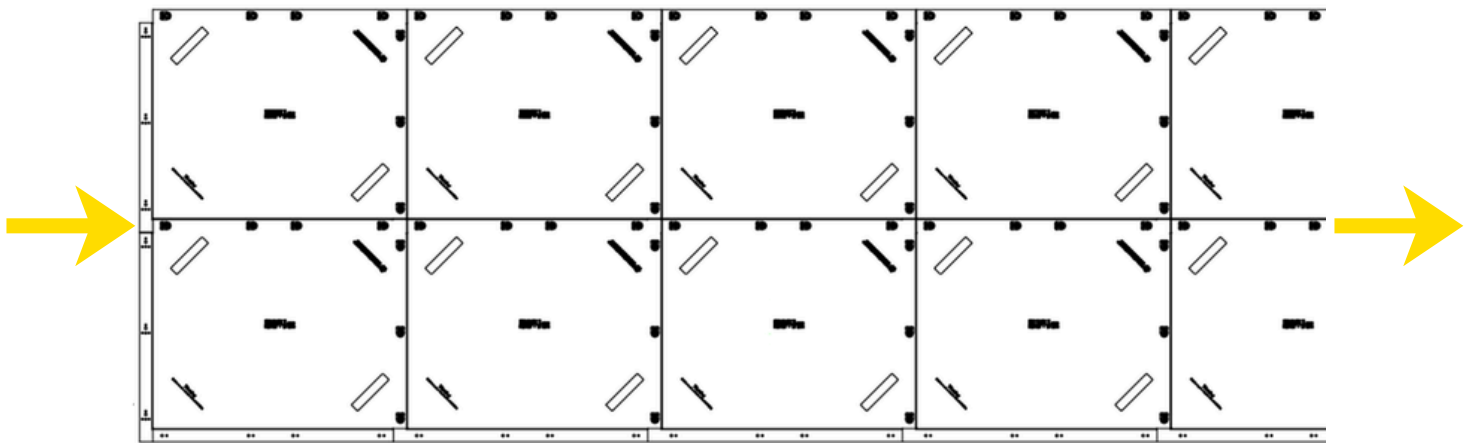


Figure Appendix 2c: Installing two mats long side to long side

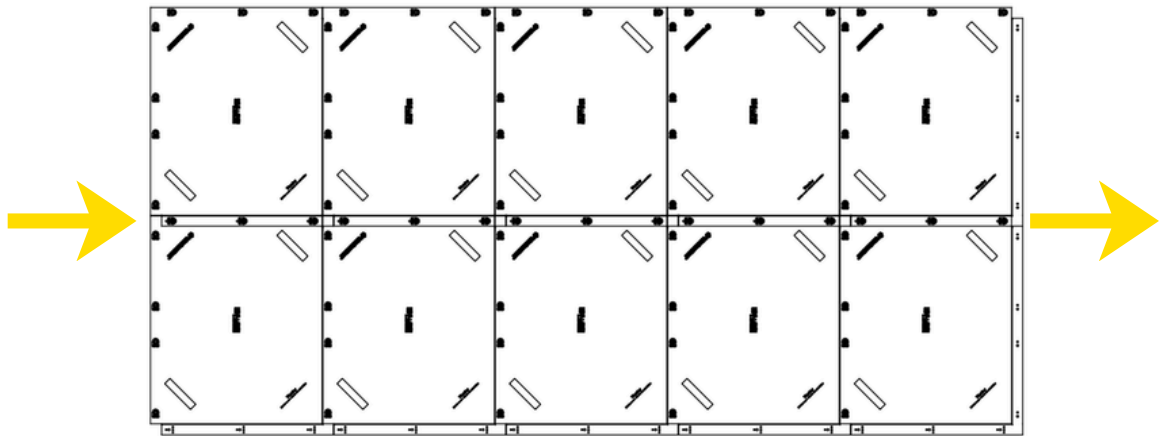


Figure Appendix 2d: Installing two mats long side to long side

Turning corners for short and long vehicles can be formed using the mats. Longer vehicles require a wider turning area and knowledge of the sweep path (refer to example below) can be used to inform the mat configuration required.

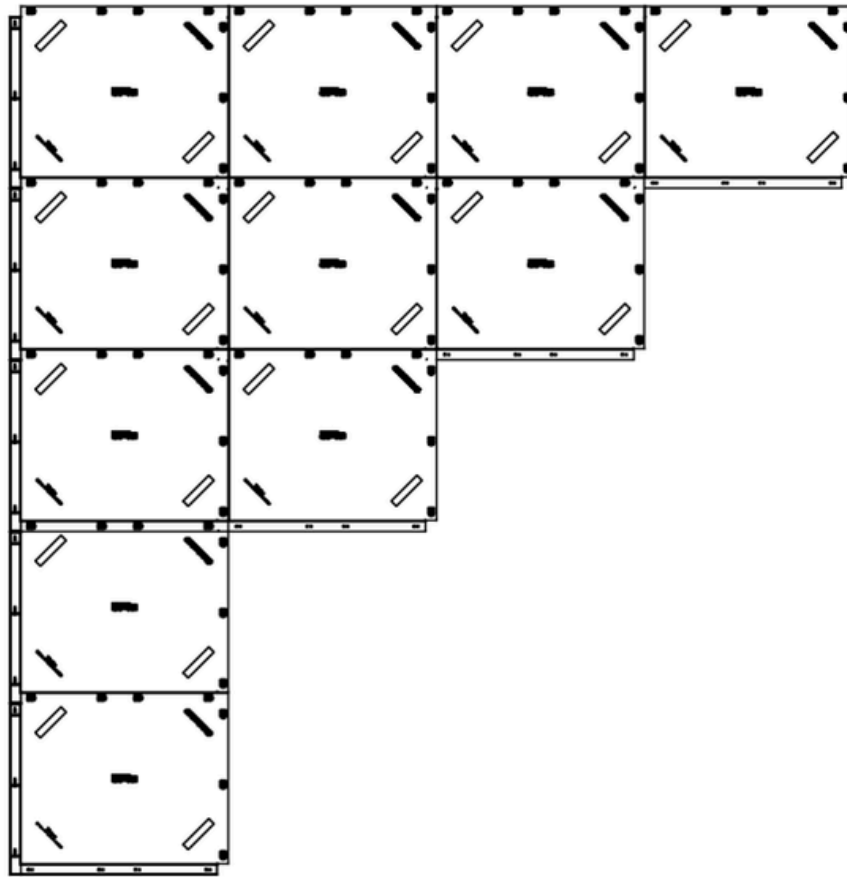


Figure Appendix 2e: Turning corner

When a Isotrack H₀₁ road meets an existing road, it may be necessary to install so-called “wings” to allow for the turning radius of vehicles:

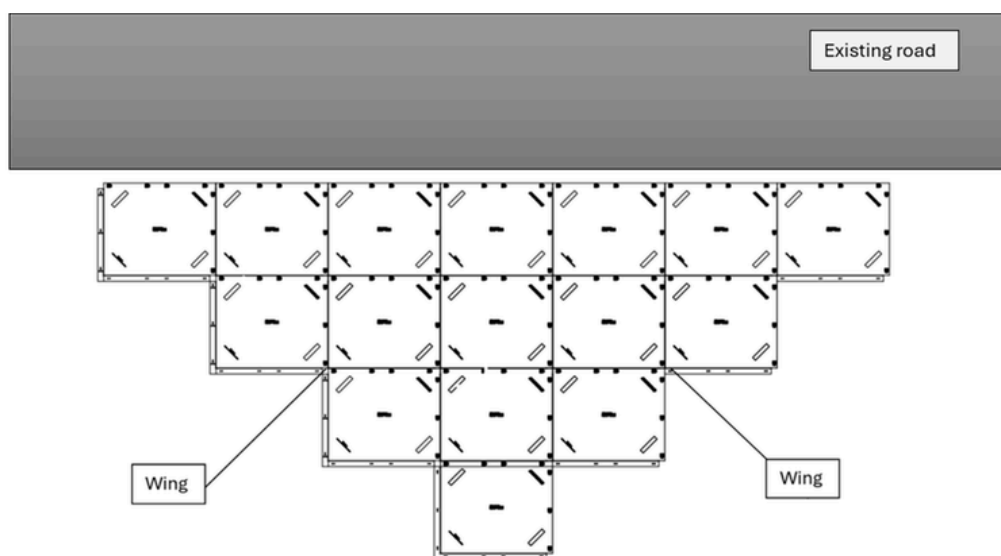


Figure Appendix 2f: Position of wings when joining the existing road

Appendix 3 – Isotrack H-Overlap Exchangeable Nut Connector Replacement Guide

While using the connector, the thread of the exchangeable nut may become corroded or damaged over time due to improper use. It is also possible that cross-threading occurs that prevents the removal of the bolt. As a result, the bolt cannot be screwed in the connector, therefore the connection will not be securely fastened.

Tool list for replacing the exchangeable nut:

- Screwdriver
- Proper bit for bolt
- Hammer



Figure Appendix 3a: Damaged exchangeable nut

Changing the Exchangeable Nut Connector

1. First, we should choose which connector to change. The proper connector should look like this



Figure Appendix 3b: New connector

2. After lifting the mat the old connector needs to be unscrewed. Three bolts need to be untightened and removed from broken connector



Figure Appendix 3c: Untighten the bolts

3. Remove the old connector from connector place

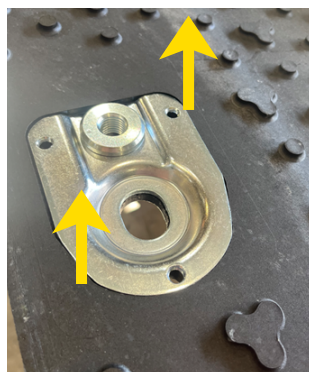


Figure Appendix 3d: Remove the old connector

4. Change the exchangeable nut with the new one

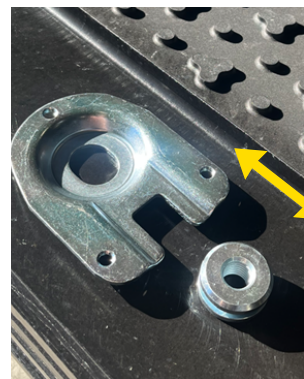


Figure Appendix 3e: Change the exchangeable nut

5. Put connector with new exchangeable nut back to the connector spot

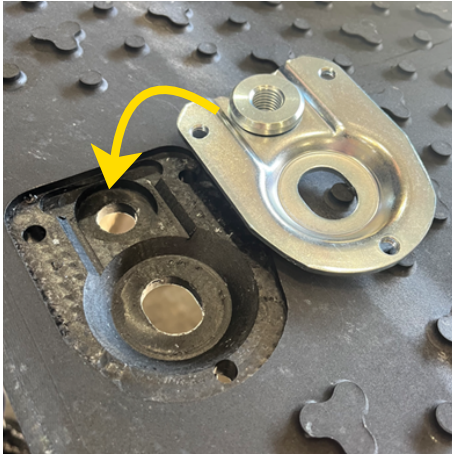


Figure Appendix 3f: Insert new connector

6. At the end screw all three bolts back to connector holes



Figure Appendix 3g: Tighten all bolts

7. New connector is ready to use.



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The mat is made from material with high compressive strength but the maximum safe vehicle weight will depend on a number of factors including the load bearing capacity of the underlying ground conditions. Advice should be sought from competent project geotechnical engineers.