



# USER MANUAL<sup>©</sup>



The TempoTrax Heavy Duty Mats are made of 100% recyclable HDPE plastic. It is an environmental friendly choice to other mats produced with virigin plastic. In this manual we will further talk about the benefits of the mats and how to use them correctly.

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# 1. TempoTrax Heavy Duty

The TempoTrax Heavy Duty System provides a safe, cost-effective temporary road and ground protection surface for lighter duty applications.

The mats are made of high performance thermoplastic material for a strong, durable, working surface that can be used for projects that require safe temporary access for lighter vehicles, operating equipment and site personnel over soft or sensitive ground.

The mats can also be used where public access is required. The mats are easy to handle (safe two-man lift) and can be installed as tracks, roadways, working pad and parking areas using a range of connection options.

The surface tread patterns provide non-slip traction for vehicles 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:

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## THE MATS CAN BE USED ON A WIDE RANGE OF PROJECT TYPES:

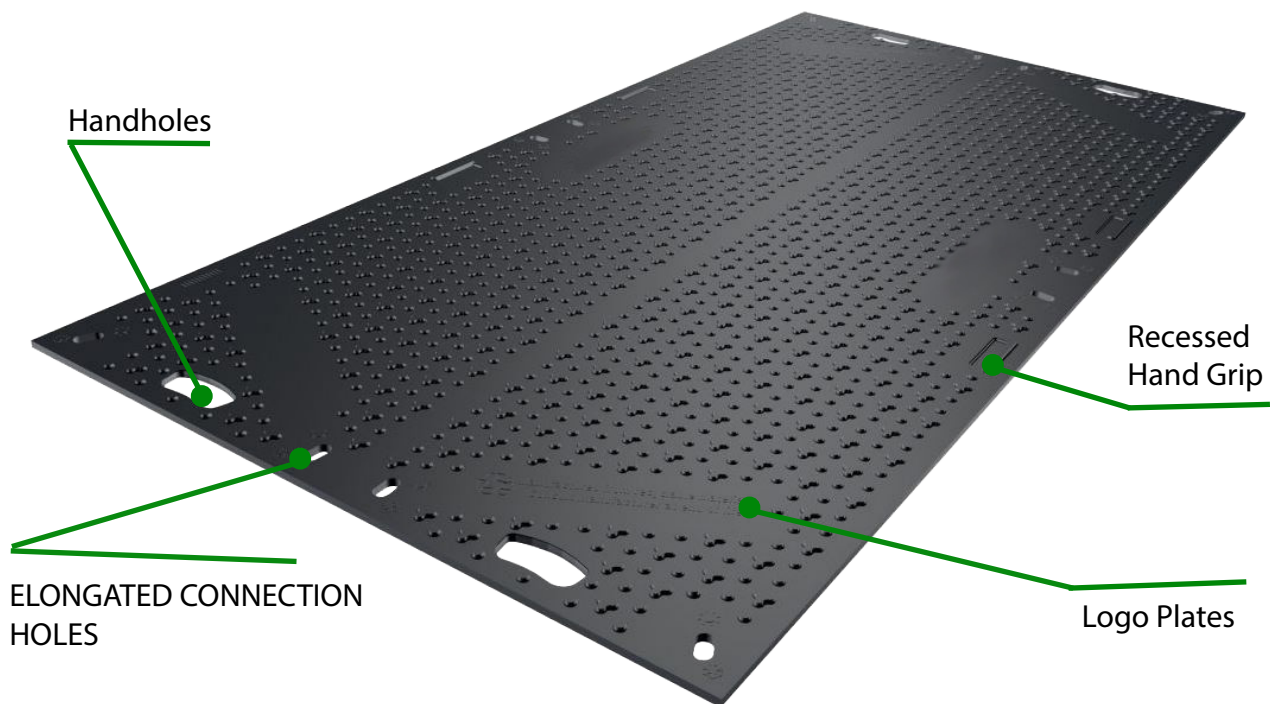
- Construction sites.
- Utilities.
- Hard and soft landscaping work.
- Sports facilities and Recreational Grounds.
- Events.



## 2. TempoTrax Heavy Duty - Key Features

### 2.1 Key Features

The Tempotrax Heavy Duty mat is 2.41m x 1.2m x 12mm thick (refer Appendix 1) and weighs approximately 37kg.



Tyre Fraction Surface








Pedestrian Surface



- Fast and easy installation.
- Two surface traction designs – one for tracked vehicles and one for rubber-tyred vehicles.
- Can be used on a wide range of different ground conditions and soil types to prevent vehicles and site personnel getting bogged down.
- Avoid costs associated with ground reinstatement.
- Flexible – will conform to ground contours.
- High performance over a wide temperature range and operating conditions.
- Four hand cut-outs and four hand grip positions for ease of handling.
- Choice of connection options depending on ground conditions and type of project.
- Unique elongated connection hole design (patent pending) to allow mat to expand and contract in response to temperature when connected.
- Can be connected in different configurations to make roadways, pads, turning areas or passing places.
- Material is chemically inert and will not rot.
- Batch marking – quality control.
- Option for customer logo marking.
- Colour options – natural virgin colour for hot climates and grass protection.
- Can be easily cut to form half-size mats (2.4m x 0.6m).
- Safer and significantly more cost-effective option compared to using plywood.
- Sustainability – 100% recyclable at end of life.

## 2.2 TempoTrax Heavy Duty Options

TempoTrax Heavy Duty Standard Mat is supplied with two different traction surfaces – see below – and made from recycled, black HDPE material. There is the option to have mats supplied that are made from natural color virgin HDPE material. Subject to minimum order volume mats can also be supplied in a different color, e.g. for corporate identity, or can be supplied with a different edge color for hire stock identification.

MAT	SURFACE TRACTION TYPE A	SURFACE TRACTION TYPE B
TempoTrax Heavy Duty - Standard mat		
MAT OPTION	MATERIAL	COLOR
TempoTrax Heavy Duty - Standard mat	HDPE recycled	BLACK 
TempoTrax Heavy Duty - Option	HDPE virgin	NATURAL 
TempoTrax Heavy Duty - Option	HDPE Recycled or HDPE Virgin with colored edge	

## 3. ENVIRONMENTAL AND CORPORATE SUSTAINABILITY



TempoTrax Heavy Duty can be used to help protect the environment and also 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.
- Contribute to accident rate reduction and lost time incidents.
- The materials used to make Isotrack L are 100% recyclable at end of life.

## 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 TempoTrax Heavy Duty should wear appropriate Personal Protective Equipment.
2. All Health and Safety requirements are complied with.

### 4.1 Transport

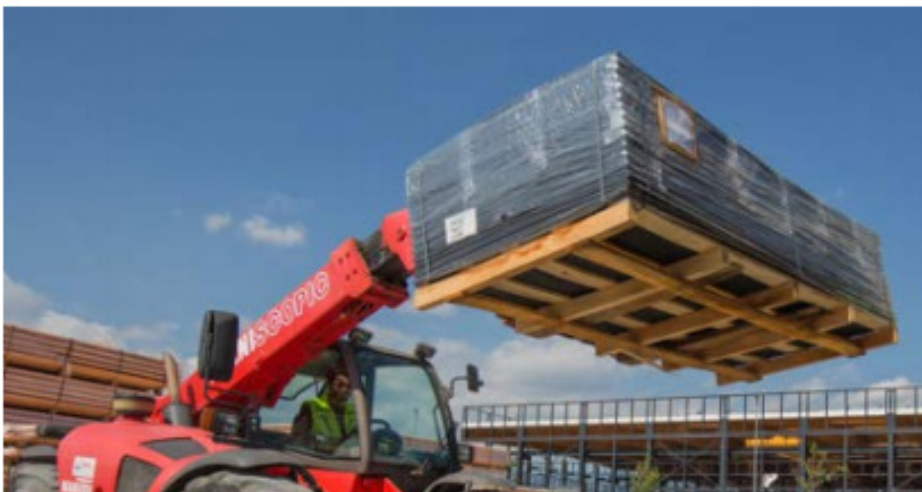
- It is good practice to ensure that mats are carefully stacked and aligned for transport.
- The mats must be safely loaded / unloaded using appropriate equipment (e.g. forklift, crane) of the required lifting and load capacity. As a general guide it is recommended that a maximum of one pallet of 50 strapped mats or 1 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).



## 4.2 Handling

New mats are delivered on pallets from the factory – 50 mats securely strapped to each pallet. The straps can be removed after unloading at a depot or just before first use on site. The pallets, 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 moving of the mats.



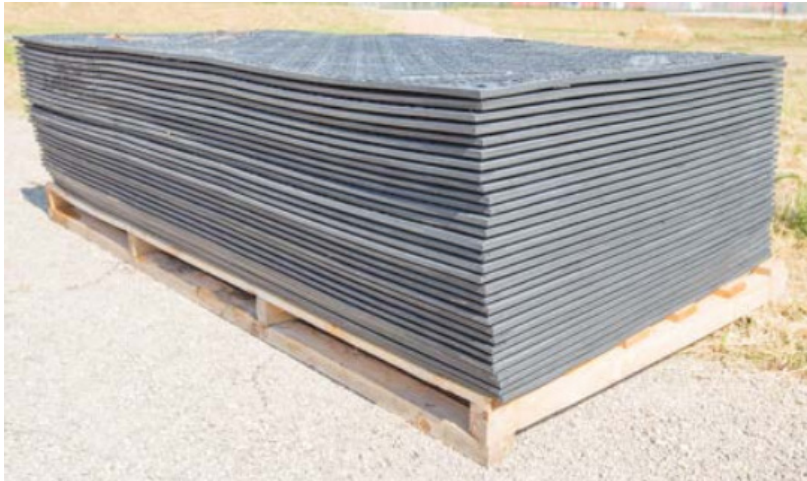


On site and in preparation for installation mats can be removed from unstrapped pallets or from the back of a truck by hand using the cut-out handholds (short side of mat – better for carrying the mat) or recesses (long side of mat – better for pulling a mat from a stack, particularly when the cut-out handholds are not immediately accessible).





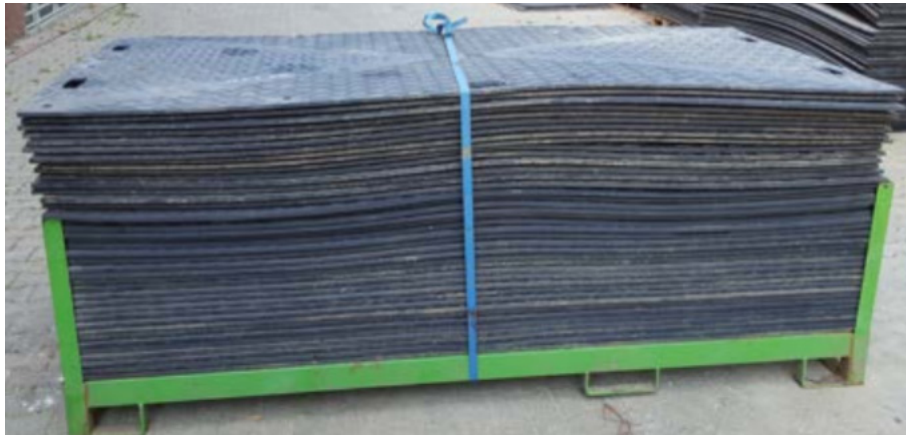




### 4.3 Storage and Stacking

- Mats can be stored on pallets as delivered until used.
- Mats can be stockpiled without pallets after use. If required, the bottom mat can be placed on wooden posts of sufficient height to position forks under the stack for lifting.
- Posts can be placed at different heights within the stack for additional fork access.
- 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 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.
- Mats can also be stored at your depot or on site using metal stillages.





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.

## 4.4 Cleaning

TempoTrax Heavy Duty mats are constructed from a high performance thermoplastic material which prevents absorption of any contaminants into its structure and provides a barrier between the ground and mat surface.

1. It may sometimes be necessary to clean mats 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 can be steam or pressure washed to remove dirt and mud and to restore optimal traction.

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.



## 4.5 Removing Snow and Ice

In cold climatic regions the mat surfaces may sometimes require removal of snow or ice. The composite 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 absolutely 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. 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 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 TempoTrax Heavy Duty mats are strong and durable and 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 to look for:

- Cracks within the mat surface. If only a minor crack then the mat maybe able to continue to be used. If a large crack or multiple cracks then it is advisable to replace the mat as soon as possible. Note – drilling a hole at the end of a small crack may help prevent it extending further.
- Missing connection bolts or parts - the bolts are part of the standard connection system and are designed securely hold adjacent mats together. Continued use with missing bolts could adversely affect mat performance. Missing bolts (or other connectors) should be replaced as soon as possible.
- Loose connection – if it is obvious that a connection bolt is working loose then it should be tightened (refer Section 5.3).

## 5. SITE ANALYSIS AND PREPARATION

It is expected that TempoTrax Heavy Duty 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).

### **Careful consideration needs to be given to:**

- Current and expected ground conditions along the routes and areas where TempoTrax Heavy Duty 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.
- Site survey along the routes and areas where TempoTrax Heavy Duty 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.
- The duration of the project and the types, sizes and weights of vehicles and equipment to be used.

TempoTrax Heavy Duty mats are flexible allowing contouring to an undulating ground surface and 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.

For larger 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 / or pad areas required.

## 6. DEPLOYMENT AND INSTALLATION

### 6.1 Lifting Equipment

Pallets of mats can be handled on site using different types of equipment as long as they are fit for purpose and meet site health and safety requirements. Typically, pallets (or stillages) of mats are lifted from trucks and / or taken to the installation area using equipment fitted with forks.

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



### 6.2 Lifting Equipment

The M10 bolts supplied with the connectors can be tightened using a standard combination / socket / ring spanner or power tool.



## 6.3 Connection

For safe installation some form of connection, fastening or pinning of the mats is **ALWAYS** required. For road / tracks each mat needs a minimum of two connectors. Using connectors will help prevent spin or movement. Each standard TempoTrax Heavy Duty mat has 12 connection holes providing options for

### Elongated Connection Holes

One of the properties of HDPE (a thermoplastic material) is that it will expand as temperature increases and contract as temperature decreases. The elongated connection holes of TempoTrax Heavy Duty are a unique design feature to allow the connected mats to expand or contract in response to temperature without causing the mats to bow up (see example below that shows mat with round connection holes typical of many mats).



It is important to be aware of this, particularly when significant changes in temperature are expected. If mats are installed during the night or early hours of the morning when conditions are cold then they will expand (length and width) when the ambient temperature increases during the day. This effect is more significant when mats receive direct sunlight (particularly black mats that absorb solar radiation and heat up more than the ambient temperature).



Connect bolt at this end if mats installed during low temperatures and if higher temperatures / sunny conditions expected.

Connect bolt at this end if mats installed during high temperatures / sunny conditions and if lower temperatures expected.



### It is therefore important to:

1. Ensure that mats are connected leaving a gap of about 10mm between mats.
2. Fasten the connection bolts in the correct positions indicated next to the elongation slots – ‘cold’ or ‘hot’ positions are indicated.
3. Not over tighten the bolts. Max. torque allowed 15 Nm. If torque is overexceded, damage on connector can occure.

### Standard Connectors

For most projects connection the polyurethane 2-way and 4-way connectors can be used.



### Standard Polyurethane 2-Way and 4-Way Connector

Once adjacent mats are aligned the following connection process should be followed:



The connector is positioned under the mat with the cylinders pushed up through the elongated holes in each mat.



Using the M10 flange head bolts supplied with the connector screw down into the top of each cylinder. A standard socket can be used with a power tool – although important not to over-tighten the bolt.

If, because of extreme temperature changes, mats start to expand and bow up due to thermal expansion then bolts can be loosened to enable repositioning within the elongation slot.



Where ground undulation is more severe or stronger connection is required for heavier vehicles the metal strap should be fitted before the bolts are inserted and fastened.



For making parking areas or work pads use the 4-way connectors adopting the process described above.

### U-Pin Connectors

It is recommended that U-pins are used in addition to the standard connectors when installing mats on a slope or where there is a slight sideways camber.

The pins can be pushed through unused connection holes or the hand cutouts before using a mallet or hammer to finally pin the mats in position.



### Connection on Hard Surfaces

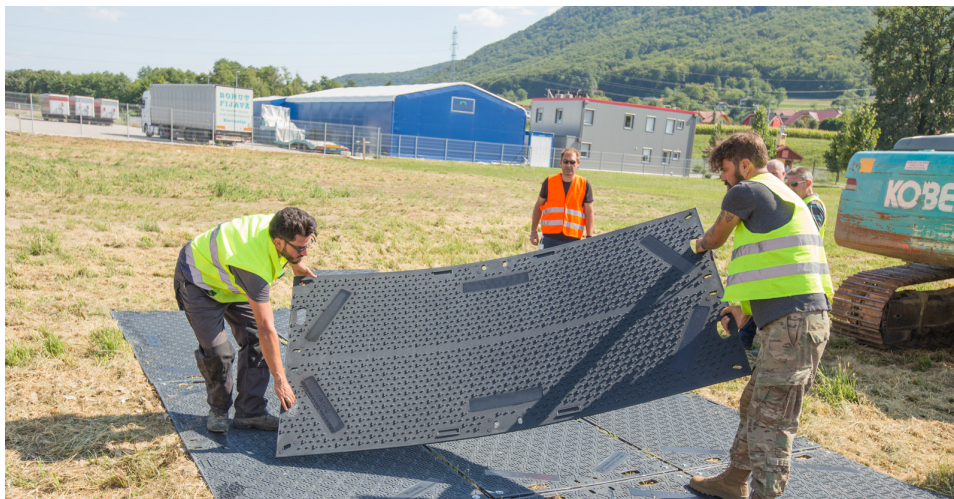
TempoTrax Heavy duty mats can be used (pedestrian surface underside) to protect hard surfaces such as concrete, tarmac and block paving from vehicle and equipment damage. It is recommended that the standard connectors are used in combination with steel straps. To prevent excess movement of the mats on the hard surface when heavy or steel tracked vehicles are being used then, using connection holes, concrete anchor bolts (picture below) can be used to firmly secure the mats into position. It is recommended that anchor bolts are used at intervals on the perimeter of the mat area installed.



## 6.4 Installation

Experienced operators involved in the installation of temporary road mats will have their preferred methods of handling and installing mats.

- A minimum crew of two is recommended for installation - to transport mats to the installation area and then to offload and carry the mats (one at a time) into position for connection.
- For increased efficiency and speed for large projects, or where ground conditions are more difficult, increased crew sizes can be used.
- On soft ground it is recommended that the installation crew work from the mats surfaces as the mats are installed.



### Removing TempoTrax Heavy Duty mats

The TempoTrax Heavy Duty mats should be removed in the reverse sequence to that used for installation.

1. Unfasten and remove the bolts of standard connectors to release adjacent mats. Bolts should be re-inserted into the connectors and safely stored for the next project.
2. Mats are lifted for stacking on pallets (to be strapped) or in stillages for safe transport to the next project or back to depot.
3. A forklift or other suitable equipment is used to lift the mats for stacking/ storage (refer section 3.3).
4. As always the correct equipment should be used to ensure safe lifting and handling of the mats.

## 6.5 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.



# 7. OPERATING GUIDANCE AND LIMITATIONS

## 7.1 Safe Speed

Tempotrax Heavy Duty 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 **most not exceed 10 kph**.

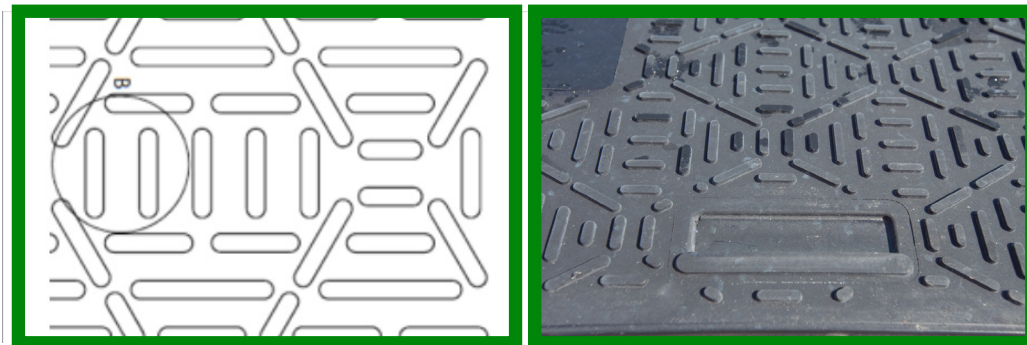
## 7.2 Bridging

The mats will flex to ground contours and small gaps beneath the mat will not affect performance. However, TempoTrax Heavy Duty mats are not designed for bridging or spanning trenches (refer section 4). The mats are intended to be used so that they are mostly in contact with a sub-grade or underlying surface so sufficient ground support must be in place before the mats are installed. This may necessitate some minor grading of the ground surface prior to installation – a more uniform surface will facilitate speed of installation and improve transfer of vehicle load across the mats.

## 7.3 Steel Tracked Vehicles and Equipment

As already noted in Section 3.5 steel tracks and equipment can damage the thermoplastic material used to make the TempoTrax Heavy Duty mat (this applies to any plastic / composite mats). When using steel tracked vehicles the following guidance is provided:

1. Ensure that the mats are installed with the 'pedestrian traction surface' uppermost:

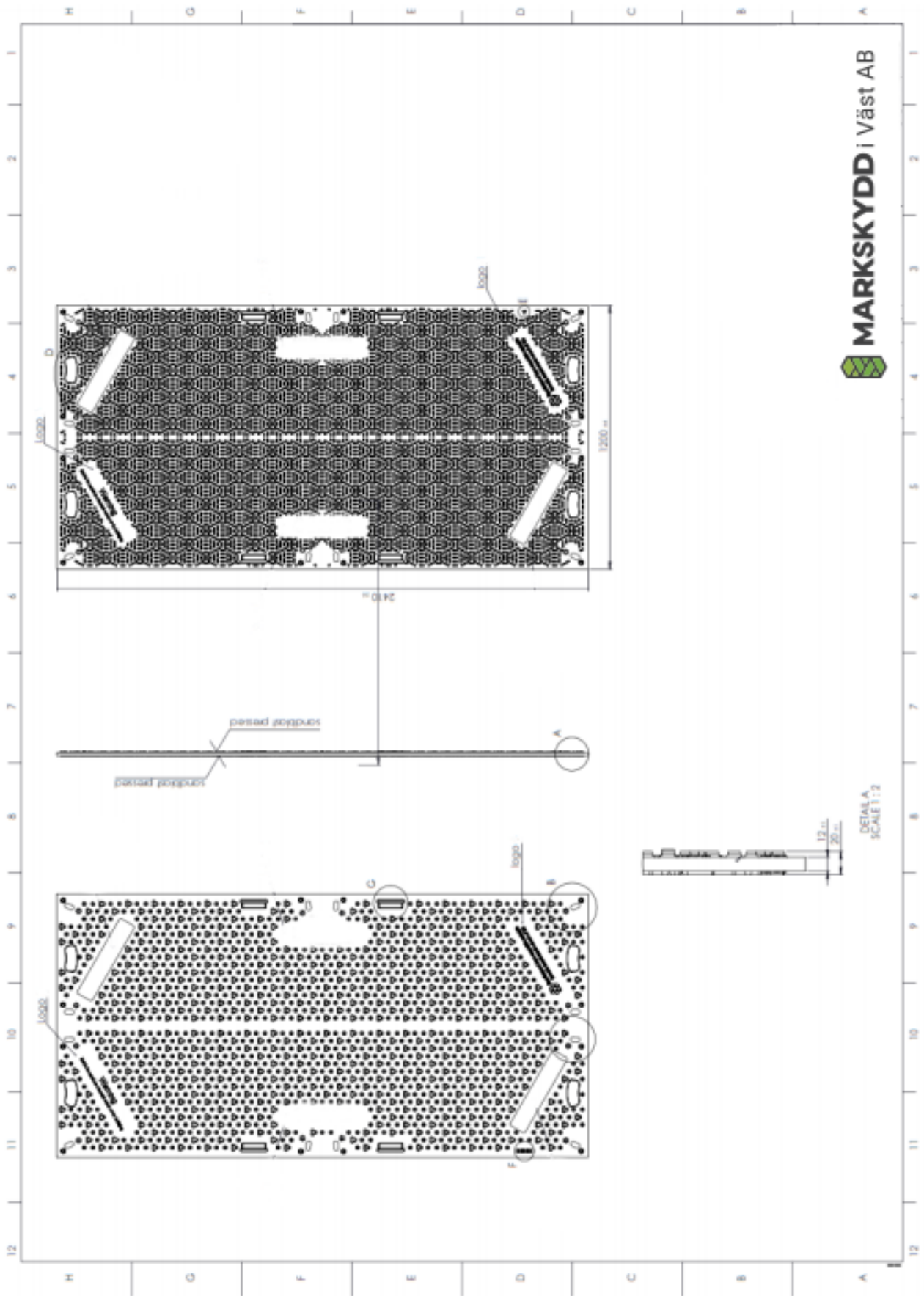


2. Plan ahead for the movement of steel tracked vehicles – it is better to have the vehicles moving forwards and backwards in straight lines within the area that they need to work.
3. If turning areas are required, then turning movements should be undertaken at very slow speed

## 7.4 High Winds

Care must be taken if installation is undertaken in high wind conditions (or high wind conditions are expected during the period that the mats will be in use). Strong gusts of wind can blow mats out of hand or can lift them off the ground. Adequate connection and pinning is required.

# Appendix 1 - Mat details



## Appendix 2 - Mat Configuration Options, Road Entrances and Transitions

### Single Track

The single track is formed by installing the mats short side or long side in the direction of the road. A minimum of two connectors is required.



## Double track





## Working Pad and Turning Areas



### Other configurations

Mats can be installed in many different configurations. For Example, the photo below shows the 2.4m length connected to two mats along their short length.



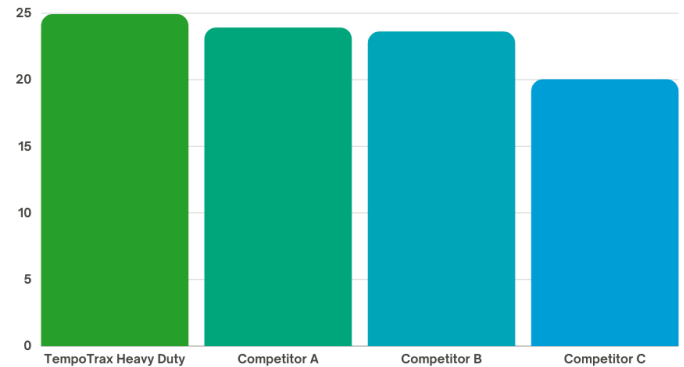
## 8. SAFETY AND PERFORMANCE

- Cost effective and safe option compared to plywood – will not warp or rot.
- Only mat with unique elongated connection holes - prevent trip hazard when connected mats expand in high temperatures.
- TempoTrax Heavy Duty surface design is based on tyre manufacturer traction research and has been independently tested to demonstrate superior grip for vehicles compared to other mats.
- Prevent vehicles and workers getting bogged down – avoid costs associated with down time.
- Avoid ground reinstatement costs.

Overall area	2410x1200 mm
Height	Total 20mm, Core 12 mm
Usable Surface Area	2,89 m <sup>2</sup>
Weight	36 kg
Color	Black (Standard), other colors optional
Logistics	Standard high cube 40' container 500 mats, EU 650 mats
Handling	Handhold cut-outs for easy handling - two person lift. No specialist tools or equipment required.
Recycling	100% recyclable
Safety	Nub structure prevents slips, trips, falls
Environmental	No liquid absorption and chemically inert. Easy to clean/ decontaminate
Load Bearing Capacity	In excess of 80 tonnes*
Fire Rating	UL 94HB

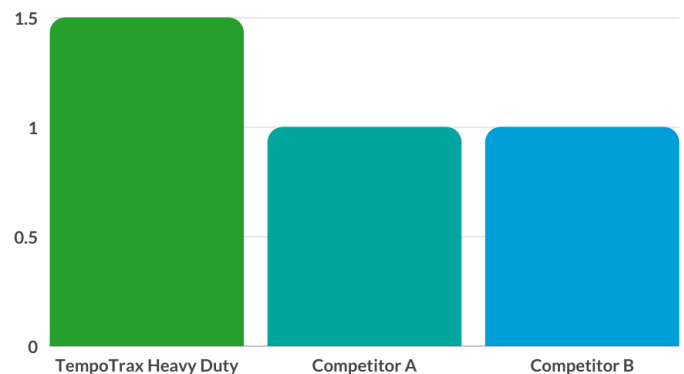
### DRY CONDITIONS

Skid Resistance - Maximum Force



### MUD CONDITIONS

Relative Traction Performance



- Testing was undertaken to compare the effectiveness of the TempoTrax Heavy Duty nub surface design with the nub surface designs of major mat competitors (solid and cellular core mats)
- A fixed load was applied to a truck tyre (pressure 6,3bars) with a contact area of 540cm<sup>2</sup>.
- The force required to move each mat surface sample under the tyre was recorded.
- Testing was carried using dry surfaces and with mud applied to the mat surface samples.
- The TempoTrax Heavy Duty nub design recorded up to 20% better results compared to the competitor nub surface designs in dry conditions and 50% better in wet mud conditions.