

**TOUGHEN YOUR TERRAIN**



**CIVIL & MINING**  
**INFORMATION &**  
**INSTALLATION GUIDE**



**DIAMONDGRID™**

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FOR A SOLID SURFACE ANYWHERE

# ABOUT DIAMOND GRID

## MINING AND CIVIL

Reduce infrastructure costs  
and eliminate on-going  
maintenance expenses

Diamond Grid surface stabilisation systems are successfully used by leading Mining companies throughout the world to cut costs on surfacing roads, shed floors and any other areas where a solid surface is required for all types of vehicles.

Diamond Grids also eliminate the need for on-going maintenance on unsurfaced roads that traditionally require machinery for road repairs on a regular basis.



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1000

T/M2 FILLED  
CRUSH RESISTANCE

300

T/M2 EMPTY  
CRUSH RESISTANCE

100

PERCENT RECYCLED  
POLYPROPYLENE

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"OVER THE YEARS OUR YARD IN WINTER TURNS INTO A MUD PIT. THE POOLING OF WATER COMBINED WITH MACHINERY CONSTANTLY CHURNING UP THE GROUND CREATES EXCESSIVE MUD, INHIBITING OUR OPERATIONS. WE SPEND HOURS NOT ONLY CLEANING MUD ETC. OFF ALL EQUIPMENT BUT ALSO FOUND WE WERE WASTING TIME ON CLEANING OUR BOOTS, VEHICLES AND OFFICES.

WE RECENTLY INSTALLED DIAMOND GRID AND HAVE FOUND THAT EVEN WITH MACHINERY EXCEEDING 50 TONNE, TRACKING AND TURNING HAS NOT AFFECTED THE DURABILITY OR RELIABILITY OF THIS PRODUCT. MORE IMPORTANTLY – NO MORE MUD PIT.

LOADEX HIRE WOULD HAPPILY RECOMMEND DIAMOND GRID AND ENDORSES THIS PRODUCT."

**LOADEX** 

MANAGEMENT TEAM,  
LOADEX HIRE,  
WEST AUSTRALIA

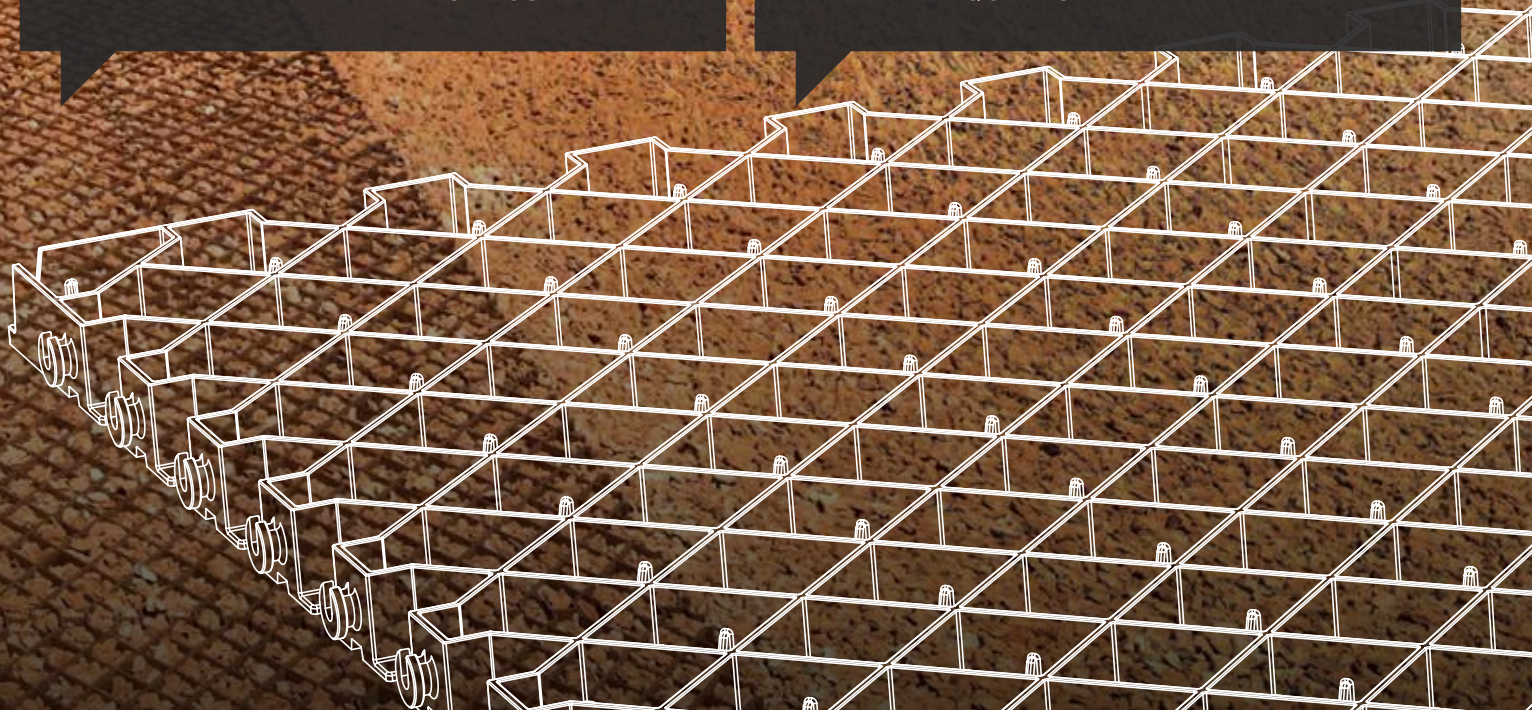
"WE HAVE USED DIAMOND GRID IN A COUPLE OF SITUATIONS ON THE QUEENSLAND NORTH COAST RAILWAY LINE SUCH AS TO CONSTRUCT STEPS FOR ACCESS TO OUR RAIL BRIDGES, WE HAVE ALWAYS HAD PROBLEMS WITH HOW WE DO THIS IN A SAFE AND COST EFFECTIVE MANNER AND DIAMOND GRID WORKS WELL FOR THIS APPLICATION.

THE HELP AND AFTER SALES SERVICE HAS BEEN INCREDIBLE, AS SOME OF THE COMPANIES THAT WE DEAL WITH JUST DROP YOU AFTER THEY HAVE SOLD YOU THE PRODUCT, FORTUNATELY THIS IS NOT THE CASE WITH DIAMOND GRID.

I WOULD RECOMMEND THIS PRODUCT TO ANYONE WHO HAS ANY ISSUES WITH ACCESS ROADS OR UNSTABLE AREAS TO FIX."



RODNEY SHEA,  
COORDINATOR CIVIL ASSETS,  
QUEENSLAND RAIL





# APPLICATIONS

## MINE PLANT PATHS ▶

Install cost effective pathways, that are durable to heavy use, stable and will not wash away or become boggy, even after intrepid weather conditions.

## ◀ WORKSHOP FLOORS

Much cheaper than concrete, Diamond Grid is a perfect solution for shed flooring. Holding up to 400 tonne per square metre, the grids are ideal for storage of equipment and vehicles. Diamond Grid's easy locking system is simple to install and can be moved if you decide to re-locate your shed.

## MINE CAMP PATHWAYS ▶

Using Diamond Grids for mining camp pathways provides a cost effective and stable solution that is also relocatable when the camps are moved.





## ◀ AIR STRIPS

Diamond Grid is an ideal solution for economic and durable airstrips, especially in remote areas, keeping the strips from becoming boggy and eroding even in high rainfall areas.



## MINE ACCESS ROADS ▶

Diamond Grid eliminates the ongoing expense of road maintenance crews and machinery, whilst providing a safe and durable surface.



## ◀ CREEK CROSSINGS

Installing Diamond Grid over creek crossings stops the roadbase and gravel from eroding away, creating a permanent solution to crossing for trucks and other vehicles.



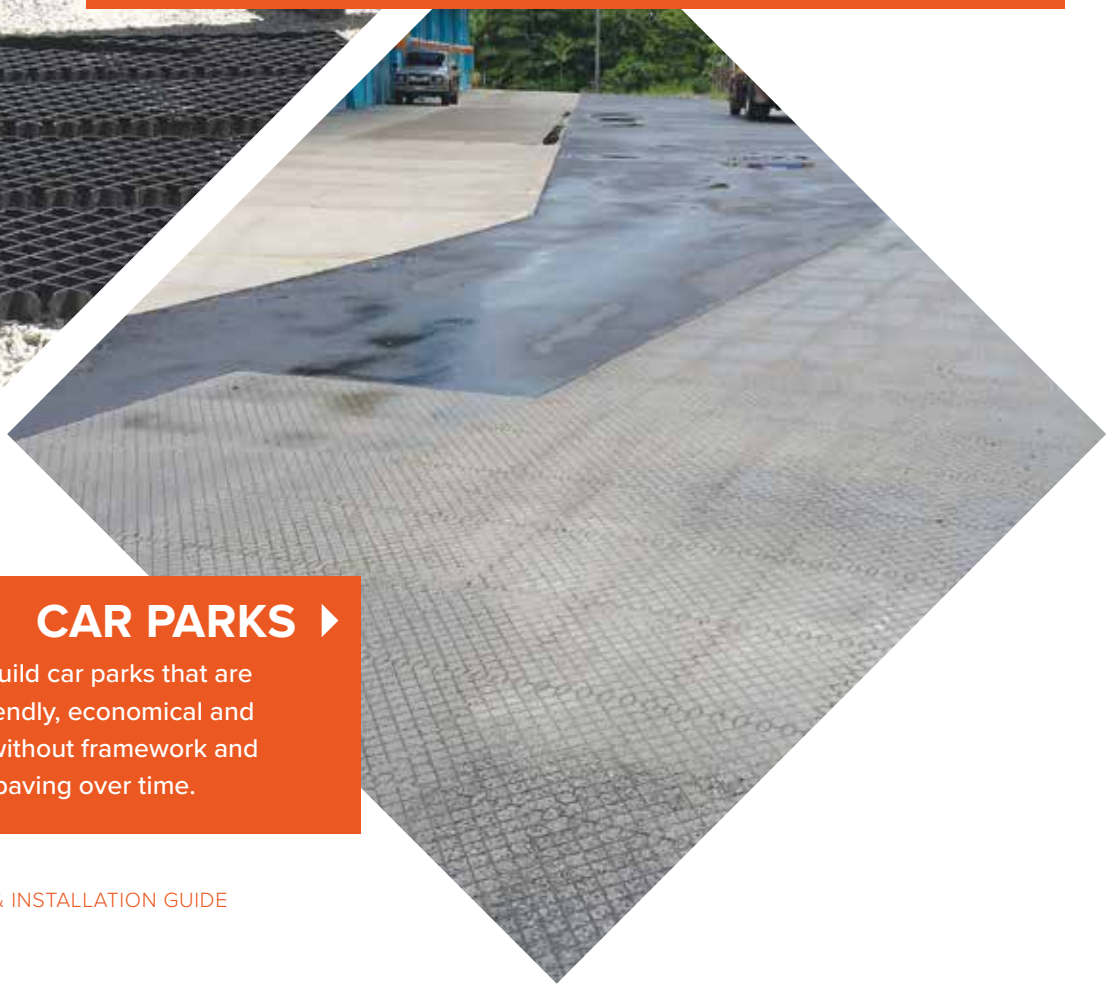
## HARDSTANDS ▶

Diamond Grid can be used to create a solid surface for hardstands without the costs associated with common sealing products such as concrete and bitumen.



## ◀ HAUL ROADS

Diamond Grid can be used as a top surface on haul roads to prevent pot holes, corrugation and erosion on road edges. The grids reduce downtime, and help reduce labour and machinery costs compared to using concrete. They also reduce the costs of running a grader to repair roads.

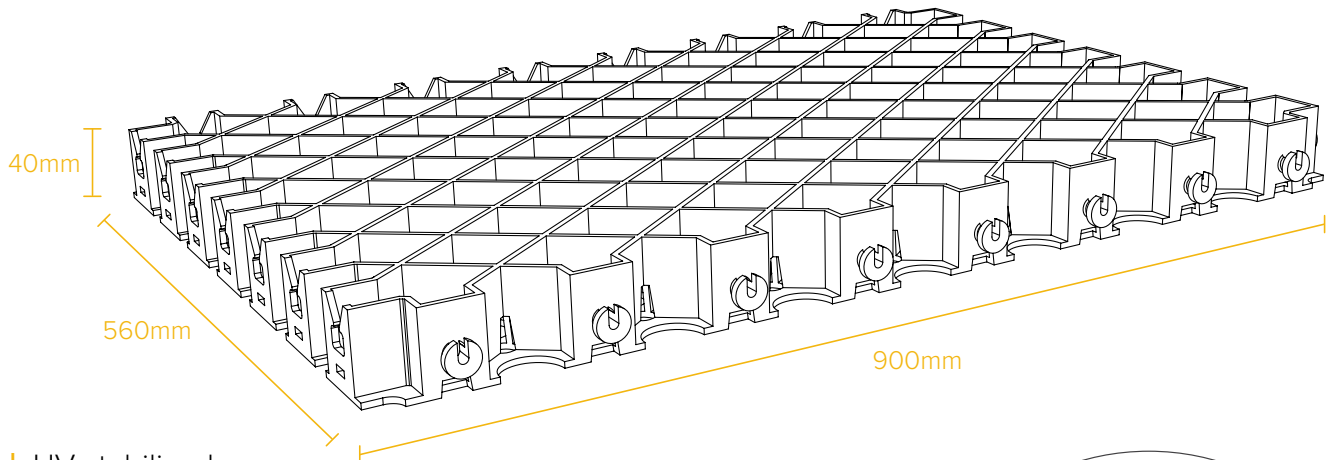


## CAR PARKS ▶

Diamond Grid allows you to build car parks that are attractive, environmentally friendly, economical and durable. They are easily laid without framework and do not crack like concrete or paving over time.

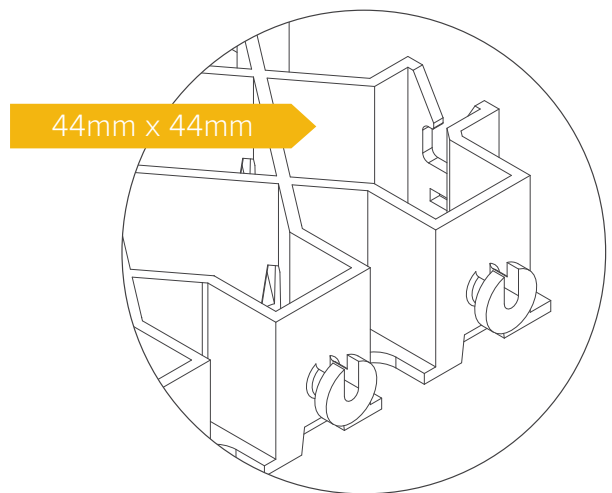
# SPECIFICATIONS

900mm x 560mm x 40mm



- | UV stabilised
- | Relocatable
- | Do-It-Yourself
- | Interlocking system

<b>Measurements</b>	900mm W x 560mm L x 40mm H
<b>Crush resistance (filled with gravel/ road base)</b>	1000+ tonne m2*
<b>Crush resistance (empty grid)</b>	300 tonne m2*
<b>Weight per grid</b>	3.2kg
<b>Fill ratio per grid</b>	1 cubic metre of fill per 25sqm
<b>Permeability</b>	Up to 96%
<b>Fill</b>	Road base, gravel, pebbles, grass, soil, concrete, bitumen
<b>Installation</b>	Visit <a href="http://www.diamondgrid.com">www.diamondgrid.com</a> or see page 11.



**The Diamond Grid interlocking system is robust and easy to install.**

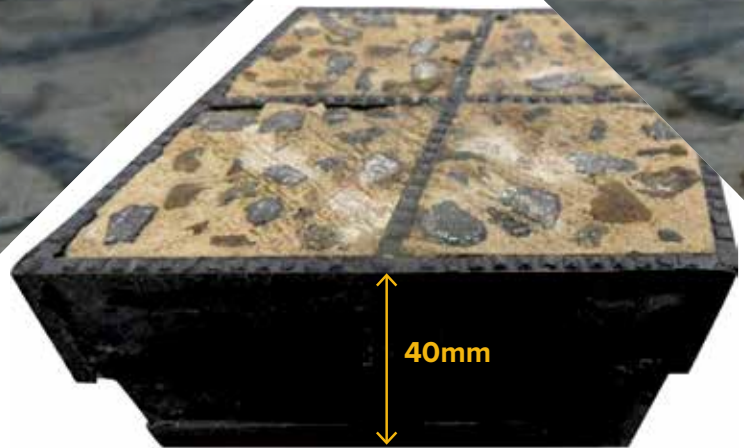
Our classic grid size is suitable for most rural and domestic applications. Great for smaller surface areas that require stabilisation and reinforcement. Highly recommended for feed & water troughs, stable floors, muddy areas, day yards, pathways, drains, driveways, golf cart tracks, boat ramps and anywhere needing toughening up on your property or workplace.



Made from 100% recycled, UV treated polypropylene, Diamond Grid is ecologically friendly and highly durable. The product has been load tested by the Facility of Engineering and Surveying Centre of Excellence in Engineered Fibre Composites, University of Southern Queensland and found to withstand loads in excess of 280 tonnes per square meter when empty or over 1000+ tonnes crush resistance per m/2 when grids are filled.



# CONCRETE REINFORCEMENT.....



## COMPRESSIVE STRENGTH TESTING\*

AVERAGE COMPRESSIVE  
STRENGTH OF ONLY  
4 GRID CELLS  
– 25 MPa



\* Testing carried  
out by Australian  
Laboratory  
Services

SAVE UP TO  
**60%**  
ON THE COST  
OF CONCRETE  
SLABS





Concrete costs can be reduced by up to **60 percent** when using Diamond Grid as the reinforcement structure, as concrete depth required is only 40mm, considerable savings can be made on concrete requirements and labour.





# CASE STUDIES

## THE PROBLEM

BHP had issues with access roads becoming unpassable during wet weather and in the period after the wet weather due to the road base surface always washing away. This was creating direct costs of on-going maintenance and costs associated with not being able to access their exploration sites until the roads are repaired again.

## THE SOLUTION

- ◆ The existing base was levelled
- ◆ Geofabric was laid over the base area where the grids were going to be laid, creating a barrier between the base and the top layer
- ◆ Diamond Grid was laid on the Geofabric
- ◆ Crushed Sandstone was spread
- ◆ The crushed sandstone was then spread into the grids and compacted with a roller.



## EXPLORATION SITE MINE ACCESS ROAD



## MINE PLANT PATHWAYS

### THE PROBLEM

BHP required the pathways around their Mine Plants to have a firm, level, well-draining surface to keep the workers out of the mud in periods of wet weather.

### THE SOLUTION

- ◆ The area was levelled
- ◆ Diamond Grids were laid
- ◆ Diamond Grids were filled with 12mm gravel.





## COAL HANDLING & PREPARATION PLANT PATHWAYS

"THE DIAMOND GRID HAS BEEN INSTALLED BETWEEN SOME OF OUR OFFICES AT THE CHPP. THE FINISHED SURFACE RESULT WAS EXCELLENT AND WAS VERY EASY TO INSTALL. WE WILL CERTAINLY BE ORDERING SOME MORE AS REQUIRED."

# THIESS

### THE PROBLEM

Thiess had some areas around their offices within the Coal Handling & Preparation Plant that were becoming very wet and muddy, water was also pooling in the area making it impassable.

### THE SOLUTION

- ◆ The area was levelled
- ◆ Diamond Grids were laid over the area
- ◆ The grids were filled to the top surface of the grid with 10mm Gravel.



## HARDSTAND AREA USED BY FORKLIFTS

### THE PROBLEM

Fortescue Metals Groups had issues with their forklifts getting bogged in the mud on their hardstand areas. This slowed down production, created safety issues in the work place and created more work repairing the damage made to the surface due to it being ripped up by the vehicles tyres.

### THE SOLUTION

- ◆ The area was levelled and compacted with a small roller
- ◆ Diamond Grids were laid over the area
- ◆ Decomposed Granite was tipped on top of the grids and spread with a Bobcat and spreader bar
- ◆ The area was then rolled again to compact the granite into the Grids.



### THE PROBLEM

All Earth Group had issues with the hardstand area where their machinery are refuelled becoming muddy and slippery. Drivers would get out of the vehicles and refuel and take the mud back into the cabins of the vehicles, creating a mess and also creating a safety issue with their feet slipping on the driving pedals from the mud.

### THE SOLUTION

- ◆ The area was excavated 40mm lower than the surrounding area
- ◆ The excavated area was levelled and compacted
- ◆ Diamond Grids were laid
- ◆ Diamond Grids are filled with road base
- ◆ The area is compacted with a roller to ensure the grids are filled completely.



## FUEL STATION HARDSTAND



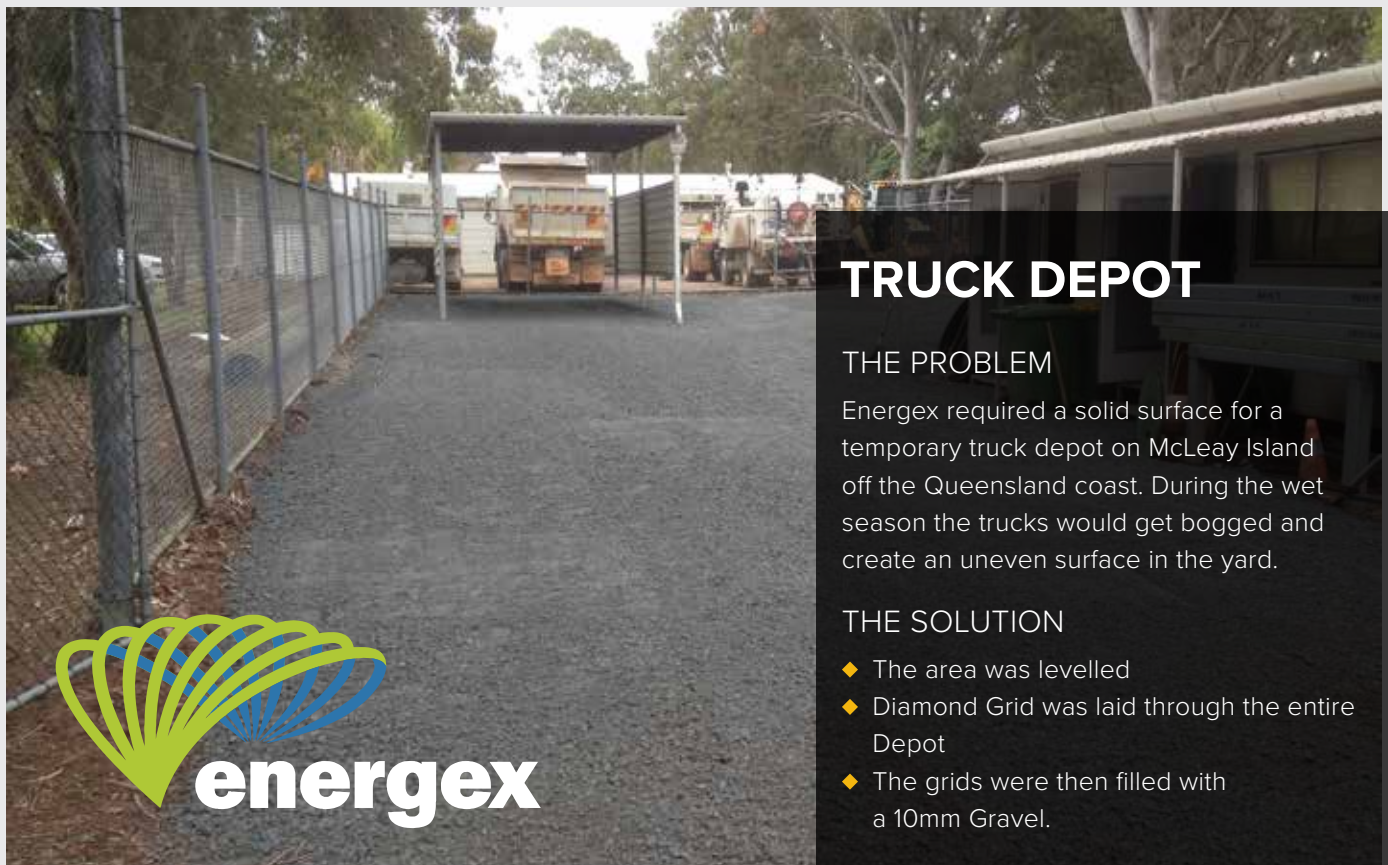
## TRUCK DEPOT

### THE PROBLEM

Energex required a solid surface for a temporary truck depot on McLeay Island off the Queensland coast. During the wet season the trucks would get bogged and create an uneven surface in the yard.

### THE SOLUTION

- ◆ The area was levelled
- ◆ Diamond Grid was laid through the entire Depot
- ◆ The grids were then filled with a 10mm Gravel.







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**LOADEX HIRE**

## EXCAVATOR YARD

### THE PROBLEM

Loadex have anywhere up to 30 Excavators, Graders, Rollers and other heavy machinery in their hire yard at any one time, weighing up to 50 tonne. They required a surface that would stop the machines ripping the ground up and creating an uneven, muddy surface.

### THE SOLUTION

- ◆ The area was levelled and compacted
- ◆ Diamond Grids were laid over the area
- ◆ Road Base was spread into the grids with a bobcat
- ◆ Road base was then compacted with a vibrating plate
- ◆ A 10mm road base surface was laid over the tip of the grids for the Excavators to screw on.



“AFTER INITIALLY PURCHASING DIAMOND GRID TO SOLVE A PROBLEM WITH A SINGLE MUDDY PATHWAY, WE HAVE SINCE KEPT DIAMOND GRID IN OUR STORES TO DEAL WITH ANY PATHS OR ROAD WAY ISSUES THAT ARISE. DIAMOND GRID HAS BECOME A CRITICAL PART OF ALL OUR INFRASTRUCTURE PROJECTS”.

**MANDALAY RESOURCES**

## PATHWAYS

### THE PROBLEM

Mandalay Resources had issues with their pathways being slippery, muddy and unsafe during the wet weather. Some sections of the pathways were on very steep slopes, making concreting expensive and time consuming.

### THE SOLUTION

- ◆ The area was levelled
- ◆ Diamond Grid laid
- ◆ Wheelbarrows of fill were carted onto the grids and spread into the grid cells.



# FILL OPTIONS



◀ ROAD BASE



10mm ROCK ▶



◀ BITUMEN



CONCRETE ▶



◀ 14mm ROCK

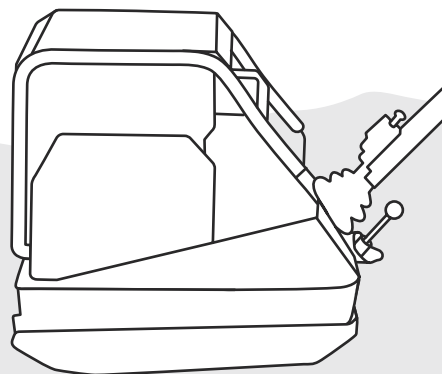


SAND ▶

# BASIC INSTALL GUIDE

## APPLICATIONS:

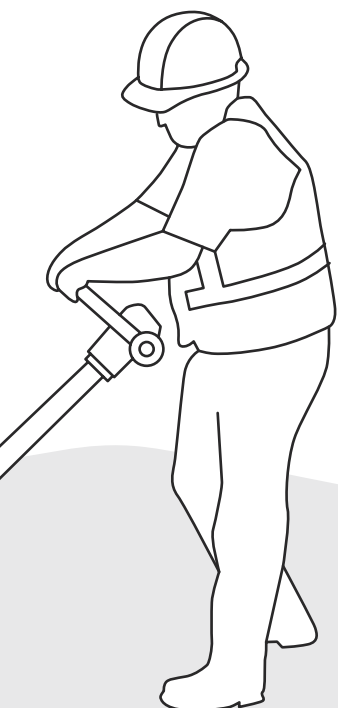
AIR STRIPS  
ARENAS  
BIKE TRACK  
BOAT RAMPS  
CAR PARKS  
CATTLE YARDS  
CONCRETE CAR PORT  
CREEK CROSSINGS  
DAIRY FARM LANEWAYS  
DAY YARDS  
DRAINS  
DRIVEWAYS  
FEED AND WATER TROUGHS  
FIRE TRAILS  
GOLF CART TRACKS  
HARDSTANDS  
HAUL ROADS  
HOT HOUSE FLOORS  
HELIPADS  
MINE ACCESS ROADS  
MINE CAMP PATHWAYS  
MINE PLANT PATHS  
MUDDY ROADS  
PATHWAYS  
Paddock SHELTERS  
SHED FLOORS  
STABLE FLOORS  
WORKSHOP FLOORS





## MINIMAL BASE PREP

- 1 USING A GRADER OR A BOBCAT AND SPREADER BAR, LEVEL THE SITE IN READINESS TO LAY YOUR DIAMOND GRID.
- 2 LAY GEO FABRIC OVER THE LEVELLED AREA.
- 3 IF THE SITE IS STILL UNEVEN, 10MM OF CRUSHED 5MM MINUS ROCK AND FINES CAN BE SPREAD AS A BEDDING.
- 4 LAY THE DIAMOND GRIDS STARTING IN ONE CORNER WITH THE MALE LUGS FACING OUTWARDS ON BOTH MALE SIDES.
- 5 FILL THE DIAMOND GRID WITH A BOBCAT AND SPREADER BAR OR SOMETHING SIMILAR AND YOUR CHOICE OF MATERIAL\*.



## MEDIUM BASE PREP

- 1 LAY GEO FABRIC OVER THE AREA WHERE THE GRIDS ARE GOING TO BE LAID.
- 2 COVER THE GEO FABRIC WITH ROAD BASE AND COMPACT TO A LEVEL 40MM BELOW FINISH HEIGHT.
- 3 COMPACT ROAD BASE WITH ROLLER OR VIBRATING PLATE.
- 4 USING A GRADER OR A BOBCAT AND SPREADER BAR, LEVEL THE SITE IN READINESS TO LAY YOUR DIAMOND GRID.
- 5 IF THE SITE IS STILL UNEVEN, 10MM OF CRUSHED 5MM MINUS ROCK AND FINES CAN BE SPREAD AS A BEDDING.
- 6 LAY THE DIAMOND GRIDS STARTING IN ONE CORNER WITH THE MALE LUGS FACING OUTWARDS ON BOTH MALE SIDES.
- 7 FILL THE DIAMOND GRID WITH A BOBCAT AND SPREADER BAR OR SOMETHING SIMILAR AND YOUR CHOICE OF MATERIAL\*.

## EXCAVATION AND MAJOR BASE PREP

- 1 EXCAVATE SITE TO A DEPTH OF 200-350MM DEPENDING ON THE CONSISTENCY OF THE SUB GRADE.
- 2 LAY GEO FABRIC OVER THE AREA WHERE THE GRIDS ARE GOING TO BE LAID.
- 3 COVER THE GEO FABRIC WITH ROAD BASE AND COMPACT TO A LEVEL 40MM BELOW FINISH HEIGHT.
- 4 COMPACT ROAD BASE WITH ROLLER OR VIBRATING PLATE.
- 5 USING A GRADER OR A BOBCAT AND SPREADER BAR, LEVEL THE SITE IN READINESS TO LAY YOUR DIAMOND GRID.
- 6 IF THE SITE IS STILL UNEVEN, 10MM OF CRUSHED 5MM MINUS ROCK AND FINES CAN BE SPREAD AS A BEDDING.
- 7 LAY THE DIAMOND GRIDS STARTING IN ONE CORNER WITH THE MALE LUGS FACING OUTWARDS ON BOTH MALE SIDES.
- 8 FILL THE DIAMOND GRID WITH A BOBCAT AND SPREADER BAR OR SOMETHING SIMILAR AND YOUR CHOICE OF MATERIAL\*.

Galahad Geosystems makes no representations or warranties in respect of the suitability of the Diamond Grid product to any customers individual applications. The information in this guide is general only and customers should seek advice prior to commencing installation to ensure that the conditions of their project are catered to.

Galahad Geosystems accepts no liability where damage is caused to the Diamond Grid due to a failure to seek appropriate installation advice prior to commencing the project.





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DIAMONDGRID™