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The solution was developed over many years. Multiple prototypes were trailed and the first iterations were put to the test with heavy mountain biker usage in the harsh sub alpine environment of Victoria's Mt Buller trail network.

HISTORY

World Trail developed the idea of an artificial rock armouring solution after years of strenuous manual handling to harvest boulders and install rock armour, a challenging and often dangerous task in remote terrain.

Different prototypes were successfully trialed including individual rocks carved from lightweight Hebel in Mt Buller, Victoria in 2011. These products have been tested over many years on the popular Copperhead flow trail, withstanding the harsh climate and heavy usage by mountain bikers.

The idea of a flexible, linked artificial rock mat was brought to life in Tasmania with the help of local fabricator Richard Goodsell in 2015.

The initial products performed very well in the field, yet needed some refining to suit World Trail's high performance standard. The new redesigned units were installed at Falls Creek in Victoria, Smithfield's World Championship 2017 course in Queensland and the highly successful Blue Derby trail network in Tasmania. Ongoing monitoring of these units have proven their longevity, durability and strength under the pressure of thousands of riders a month on these trails.



ARM is a strong, natural looking, flexible, cost effective and consistent product for hardening trail surfaces successfully in all conditions.





PRODUCT

WHAT IS ARM?

ARM is a modular, natural looking, multi-boulder solution, interconnected via a strong linked mesh which can be interlaced with other units resulting in a hardened surface anchored to the ground.

The product allows treatment within fragile or sensitive environments or high use impact zones, resulting in a longlasting and sustainable trail surface.

ARM is easily transportable, manageable, cost-effective and is extremely efficient as an alternative in areas where water is an ongoing problem and useable natural rock is sparse.

The unique design allows for flexibility over undulating terrain, including berms, rollers and drops while imitating and adapting to the existing ride surface.

HOW STRONG IS ARM?

Our product is made from a unique concrete mix, rated in excess of 50MPa compressive strength at 28 days, which is well above the industry standard, plus the tensile strength (breaking load) rating is in excess of 7.2 KN at 40mm thickness.

WHAT DOES THE MESH ACHIEVE?

The mesh acts as reinforcement and allows the sheets to be easily handled and fixed into the ground. The commercial marine grade Nylon mesh provides maximum flexibility over undulating terrain and is incredibly durable.

Over the years different mesh materials were trialed to find the perfect combination of strength, durability and flexibility.

The mesh sits 15mm from the base of the unit. The unit's maximum thickness is 60mm. The commercial marine grade 4mm Nylon 100mm x100mm mesh adds reinforced strength and allows the sheets to be flexible.



WHY THE SHAPE?

The shape has evolved to its current pattern after trialing different styles and sizes while refining the pattern to offer an ideal mix of natural look and ride texture.

The pattern allows the sheets to seamlessly interlock with each other but also allows an amount of flexibility for arcs and direction changes.

WHAT IS THE WEIGHT?

Each sheet weighs in at approximately 36kg.

It was important to keep the weight down, yet ensure each unit is sturdy enough to maintain its structural integrity in the field. When interlocked together, this amplifies the total weight and strength on the ground.

The 36kg weight helps with transport and installation. The lightweight design is due to the unique mix of raw materials and superior cement type used.

WHY THE SIZE?

The size was determined for ease of transport – two sheets fit side by side on a regular hardwood pallet making it costeffective to transport and handle. Each pallet can hold 26 units of ARM weighing in at 970kg per pallet.

The shape is an evolution of designs tried and tested by World Trail to provide ideal rider feel, durability and a natural look.

HOW IS ARM SECURED?

Depending on the soil in which the product is installed, there are a few options for securing. Soft sandy or moist muddy areas require small pegs such as sand pegs, 100-250mm long. Areas with a firmer base requires a hook peg 250-400mm long. Heavy-duty ties are ideal for fixing sheets together via the nylon mesh matting.





PROS

- Lightweight
- Easy install
- Does not require skilled tradesman to install
- Sizing allows for accurate quoting
- Transportable
- Durable
- Bendable, moulds over rollers, berms etc
- Abrasion resistant
- Soft ground solution
- Boggy area solution
- Textured tread
- Cut to fit

CONS

• Not suitable for flowing streams











WHY ARM?

TRANSPORTATION

- ARM has been developed to allow 26 sheets at 900mm x 600mm per pallet, at 970kg
- Transportation on to the trail can be done via a wheel barrow or power carrier

TOOLS/ITEMS REQUIRED

- Shovel, rake hoes, plastic rake, hammer, scissors, snips
- Metal or plastic pegs
- Metal or Plastic cable ties

WHERE TO INSTALL

- Soft unstable ground, sand or problematic soils
- Boggy areas
- Unavoidable steep declines
- Creative steep inclines
- Problematic abrasive braking sections
- Water seepage or soakage areas
- Braking bumps or whoops
- Ruts and unavoidable fall-line sections
- Stabilising entry/exit of rock armoured water crossings







STEP 1

SET UP

- Determine the size of the area to be treated. Ensure correct measuring of the area for installation, allowing for extra moisture seepage at the entry and exit of the required area
- Determine layout pattern for the sheets of ARM – i.e. either landscape or portrait
- Calculate ARM sheet quantities
- Determine required mounting system i.e. pegs, cable ties
- Never install in flowing streams or potential high-flow water courses
- Advise public when and how long the trail is closed
- Close trail with bunting and signage during installation process
- Transport ARM via safe and manageable means to ensure no damage to ARM during transport
- Stockpile sheets close to the area to be treated at a safe height
- Ensure there is no damage to surrounding vegetation
- PPE required gloves, glasses, steel cap boots

STEP 2 PREPARE TRAIL SURFACE

- Use excavator or rake hoe to level the area to be treated
- Shape the base trail to mimic the natural trail shape, taking into account grade reversals and berms
- Any soil removed should be stockpiled nearby for a coating surface after the ARM has been installed
- Trail surface must be free of protruding rocks or roots. Protruding rocks or roots will result in unstable installation and potential future failure
- If required, install a base layer of imported soil to improve stability
- Check the depth of the cut is suitable for ARM installation
- Adjust the ride line using chokes to align riders in the centre of the ARM, to prevent short-cutting or riding off the edge
- Portions of the ARM sheet can be removed to fit around large unmovable roots or rocks

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STEP 3

INSTALLATION

- Install first sheet, starting from the lowest point and working uphill
- Once the sheet is in place on the ground, stand back and check the trajectory and alignment with the rest of the trail
- Check ARM is sitting evenly and solidly on the ground without rocking or movement under pressure
- Before securing the first sheet lay the second sheet and line them both up
- Join the sheets with cable ties
- Trim off excess matting
- Secure ARM to the ground by placing the pegs through the matting
- Repeat the process of placing the next ARM sheet, lining up, cable tying, trimming and pegging

STEP 4 FINISHING TOUCHES

- Spread stockpiled topsoil over ARM product, raking or sweeping it into the gaps between the individual rocks
- Compact soil in the gaps between the rocks

Form, function and sustainability are brought together to create one of World Trail's most innovative trail solutions to date.



SOLD IN PACKS OF 26

Various sizes and models available. **NOTE:** Size, colour & style of ARM represented in images may differ.



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