

CASE STUDY - DOC TONGARIRO TAUPO CONSERVANCY – 23- 03-08

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Project

Tongariro Alpine Crossing (TAC) - Tongariro Northern Circuit Upgrade

Track Upgrade Background

DOC has ever increasing numbers of walkers accessing the TAC. It is now experiencing up to a 1000 people a day at the height of season and around 75,000 visitors a year in total.

With such large numbers of walkers, three issues became apparent to the DOC staff charged with the management of this pristine environment.

- a) The inevitable increased environmental impact i.e. the physical wear and tear that walkers cause.
- b) The issue of maintaining a track which can be walked by people with varying athletic abilities.
- c) Maintenance of a walking track in a very harsh alpine environment where the ground structure is largely volcanic rock/ash and devoid, for the most part, of vegetation.

DOC staff had to strike a balance between what was cost effective in maintaining the facility and within their budget, and what could be done that was compatible with the environment into which the track has to operate. Even with their wealth of experience of track building, this scenario provided a challenge. A solution was found in the form of a “Geocell” plastic mat and the Tongariro/Taupo Conservancy people imported a product from Europe and began to devise laying techniques around this new product.

Twelve months ago a Jakaar employee believed we could design a better “mouse trap” here in NZ and we contacted DOC Tongariro/Taupo and meet with Herwi Scheltus. After meetings and consultation our design team went to work and **JakMat Enviro** “geocell” was developed as a result.

Construction Steps

After many years of experience in laying geocell, DOC and their contractors have developed a system of track construction, as employed on the TAC, which is as follows¹.

1. The **JakMat Enviro** can be laid directly onto the parent or existing ground structure² often with minimal preparation.
2. The ground should be levelled although a degree of variation can be tolerated due to the flexibility of the mat.
3. Once in place the mat is anchored with pins. The pins used in the TCP were 10mm x 300mm reinforcing steel pins and they were then grouted into the cell they were driven through. The grout used was readily available plasterer's mortar. The numbers of pins used is a function of the terrain and conditions. The Tongariro Crossing could be classed as extreme and two pins per two linked mats were used.
4. The **JakMat Enviro** is then filled with the aggregate, a GAP20 with high binder clay, or similar locally available material, and this is then compacted. A further 50ml (compacted) layer is put on top of the mat.



¹ This methodology is not a mandatory process but rather a guide. It is an evolving process and variations are possible considering the terrain, load requirements and time span considered as regular maintenance.

² There will be cases where laying direct onto parent ground is not recommended e.g. in wet areas where a geotextile may need to be considered to reduce fines migration but allow water passage.

5. It is preferable to aim for a 2° (3-4%) slope from the mid point of the track (Crown Track) to the sides to create a positive slope for water run off.
6. Timber edging of the track can be used where high water shed is a potential i.e. areas where there is slopping ground above the track and in these situations a drain is dug behind the timber, it is lined with bidim (geotextile) and filled with rocks.



Summary

The adoption of the **JakMat Enviro** mat has been part of DOC Tongariro/Taupo continued search and experimentation with different techniques to create more durable tracks. To date the product has performed very well, particularly in its prime function of maintaining a base track foundation, which does not require reasonably frequent major reconstruction, but still needs periodic remedial maintenance. The result is therefore a track suitable for high frequency use and a reduction of on-going maintenance costs.



Other Applications

Other **JakMat Enviro** application areas continue to be identified by DOC staff as they strive to find solutions to the problems associated with increased foot and vehicle traffic. Areas of focus for ground protection have been around huts on the tracks, service buildings, such as ablution blocks and beginnings and ends of tracks / walkways. There have been some applications in car parking areas where a grass surface has been maintained despite vehicle wear and tear, especially during the winter. A parking area schematic drawing is available on request.

The function of this case study format is to circulate information to those involved in the industry so as opinions and ideas can be viewed widely and assist others. Jakaar Industries Ltd is not actively involved in the laying of geocell product and hence does not have expertise in this area. We are plastic manufactures involved in designing of plastic products to perform a particular function. The information in this sheet is to the best of our knowledge true and accurate and all instructions, recommendations and suggestions are made without guaranteeing. The product should be stored and handled observing good industrial work practice guidelines and regulations.