

Road Scanning System

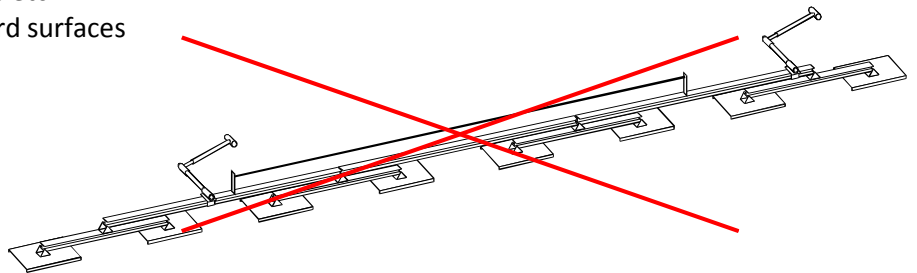
One of the latest technologies available to Paver and Milling Machine operators is the RSS or Road Scanning System. As an electronic replacement for the mechanical multi-foot ski the RSS incorporates a laser scanner and computer to create a nominal height for Paving and Milling.



The Old Way

Developed over 25 years ago the mechanical multi-foot ski provides a smooth longitudinal reference, however it suffers from the following disadvantages.

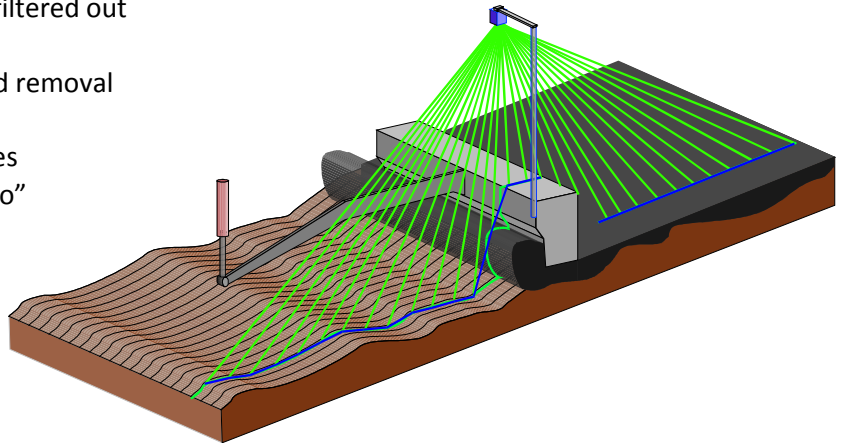
- only works out side the screed not where the actual paving is taking place
- can be heavy and hard to use on some jobs
- takes time to mount and remove
- will stick to membranes etc
- can only be used on hard surfaces
- is of a fixed length



The New Way

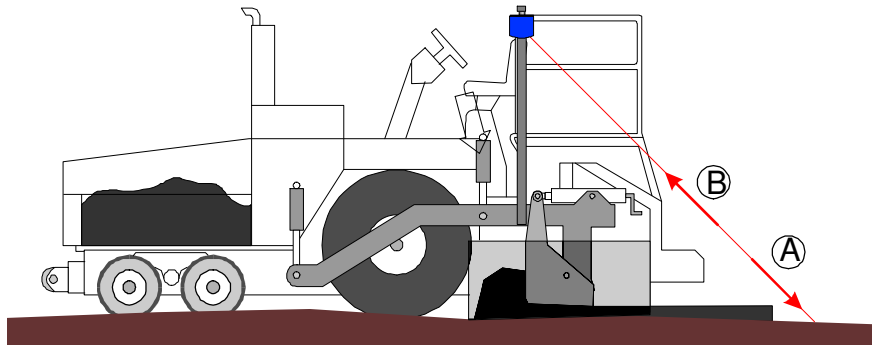
With the new Road Scanning System the following benefits are derived:

- extreme level differences are filtered out
- no mechanical wear
- easy to use – simple set up and removal
- no contact with the surface
- works on hard and soft surfaces
- adjustable ski length “on the go”
- can be used inside the screed



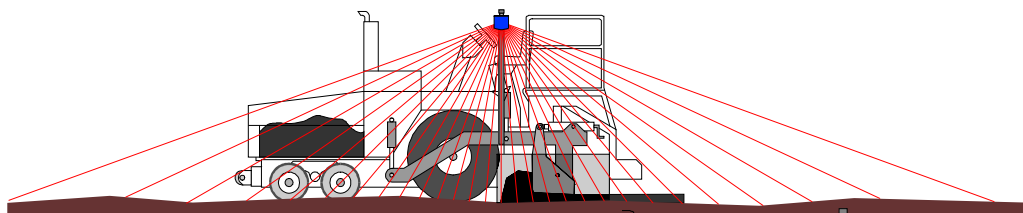
How Does It Work?

The RSS works on the principle of distance measuring as shown in the attached diagram. The scanner sends an invisible pulse to surface (A). This pulse reflects from the ground (B) into a reflector inside the scanner. Sophisticated electronics measure the time elapsed between sending and receiving the pulse. Since light travels at a constant speed the elapsed time can be used to calculate the distance the pulse has travelled. The longer it takes the greater the distance.

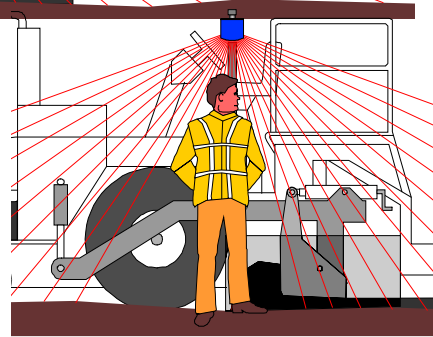


A Complete Profile

The system works by means of an internal rotating mirror inside the RSS Scanner. The Scanner takes a distance measurement at every degree and sends this data to the RSS Computer where a detailed profile of the sealing surface is processed.



The first thing the RSS Computer does is to filter out large objects, such as people or machine parts (e.g.



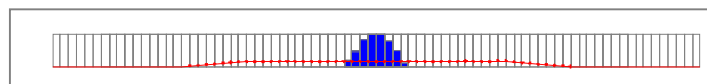
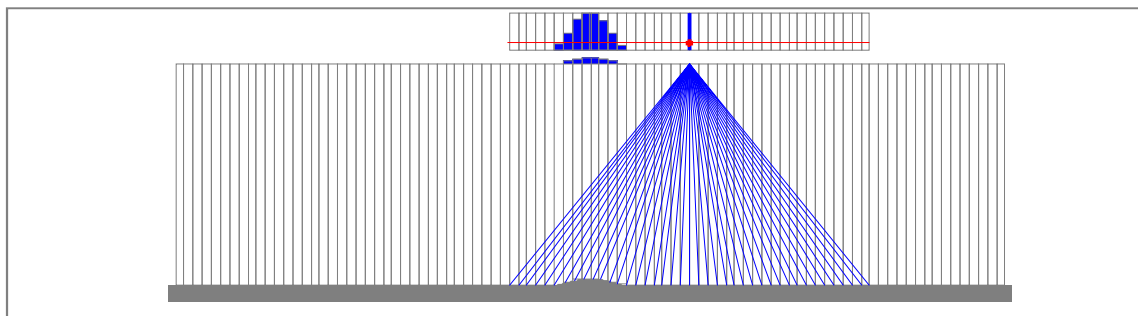
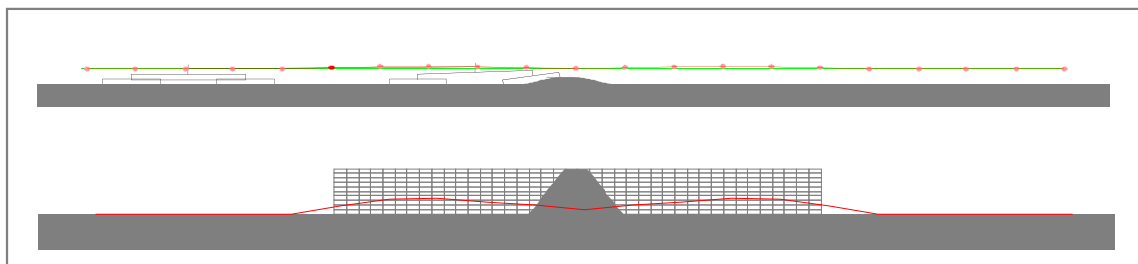
the screed). With the remaining profile an average height is calculated and sent to the RSS computer.

Mechanical vs RSS

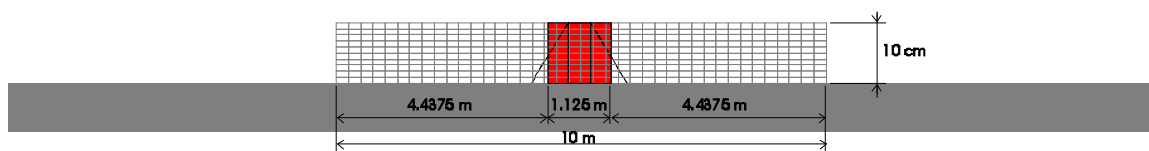
The difference in operating principle between the traditional mechanical system and the RSS is highlighted in the following diagrams.

We can see below that whilst the mechanical ski tends to caterpillar over a bump repeating it over again the RSS makes and keeps a constant average height once the obstacle is in the scan range.

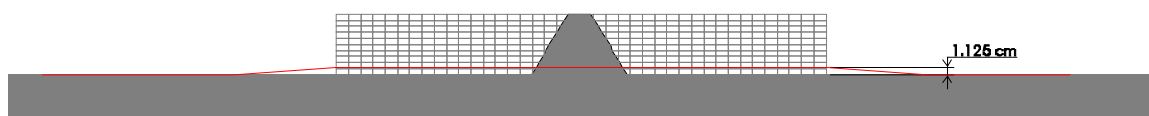
Mechanical Ski vs RSS



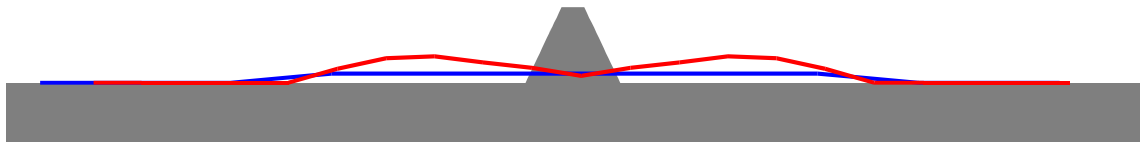
In this theoretical example the average increase in mat depth assuming a 10 meter scan length and a 10 cm x 1.125 m obstacle is only 1.125 cm.



$$\frac{4.4375 \times 0 + 1.125 \times 10 + 4.4375 \times 0}{4.4375 + 1.125 + 4.4375} = \frac{11.25}{10} = 1.125$$



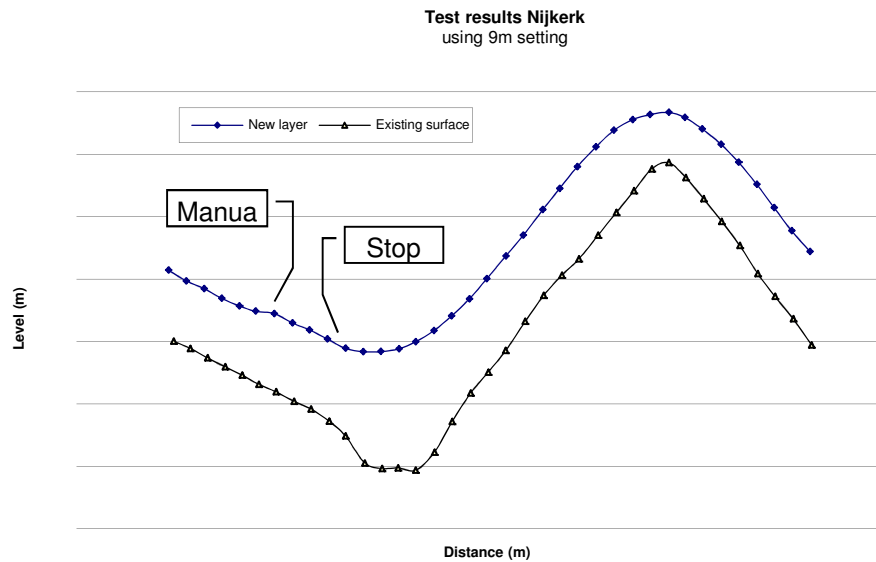
Comparison of the Mechanical Ski vs RSS



Results and Facts

The attached diagrams show various before and after shots of the RSS in action. End user results for Asphalt Paving have been very positive. Experience in New Zealand has been gained in varying jobs from Open Graded Overlay, Remedial works, Deep Lift Milling and Super Pave surfaces.

Test Results Using 9 Meter Setting





Before



After



After



In general the system works well and provides a particularly smooth surface when referencing inside the screed. It has also proven to be suitable in certain Milling applications.