



# PRODUCTS & SERVICES

## CAPABILITIES STATEMENT



WE OPEN THE WAY



# SURFACE YOUR GRAVEL ROADS WITH GRADED SEALS.



*Surfacing 20km of your road network will preserve one olympic size of scarce gravel each year from traffic and water erosion.*

**Graded seal one month after construction on rural roads**

Otta seals were developed in Norway in the 1960's to surface gravel roads using a coarse graded alluvial gravel and a soft binder. Otta seals rely on the soft binder migrating through the graded aggregate after being spread over the freshly sprayed bitumen. This action is achieved during rolling of the mat with pneumatic tyred rollers and in-service by the vehicular traffic.

**COLAS and has been surfacing gravel roads with graded seals in Southern Africa and Canada since the 1990's and more recently in Australia since 2018. COLAS has further enhanced the performance and durability of Otta seals and made them more robust by:**

- Modifying the cutback binder with crumb rubber from old tyres to make the seal more durable,
- Precoating the graded aggregates to improve the stone retention in the early life of the seal,
- Restricting the % of fines in the graded aggregate to reduce stone loss,

With tighter restrictions being placed on using gravel from borrow pits, we use blended aggregates from commercial sources with quality control processes in place,

In a new development, COLAS uses high float emulsion to replace cutback binder to construct graded seals without using cutters.

**Surfacing your low trafficked gravel roads with COLAS Graded Seal will provide the following benefits to society and road asset owners:**

**Provides positive outcomes for the environment by:**

- Eliminating the generation of dust from traffic
- Preserving scarce gravel resources by cessation of gravel loss from traffic and erosion

**Improves the outcomes for road users by:**

- Providing all weather access
- Reducing vehicle operating costs
- Reducing traveling times
- Improving road safety

**Reduction in gravel road maintenance costs by eliminating the need for ongoing grading and regravelling.**

**Requires less base preparation than conventional sprayed seals:**

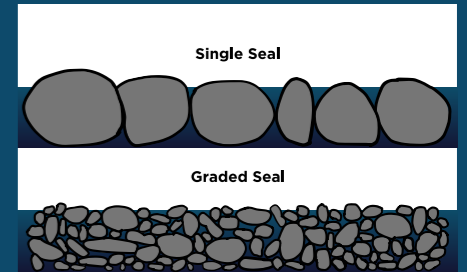
- Can tolerate uneven base course surfaces
- No priming of the base is required
- Can be constructed at low ambient temperatures down to 10°C
- More forgiving to base defects due to self-healing binder

**Use of graded aggregate allows high binder application rates:**

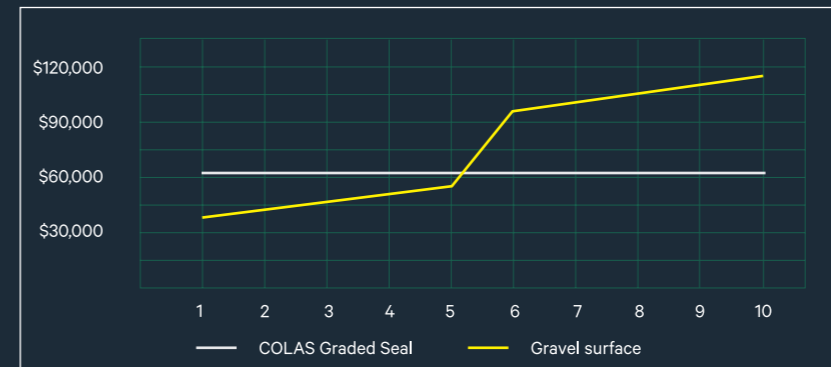
- Without risk of bleeding
- Is more durable and longer lasting than a single seal

## WHY SURFACE LOW TRAFFICKED GRAVEL ROADS WITH COLAS GRADED SEAL

Gravel roads require ongoing grading and regravelling to keep them in a good condition. This places a burden on existing gravel, human, and equipment resources. By surfacing your existing gravel roads, you will eliminate this ongoing maintenance need and after 5 years you should recover the cost of the new surfacing as shown in Graph 1.



**Diagram 1:** Comparison of a single seal and a graded seal



**Graph 1:** Typical accumulative costs of maintaining 1km of gravel road over 10 years

**COLAS Graded Seals are most cost-effective for surfacing a gravel road when:**

- the traffic volume exceeds 50 AADT
- it requires frequent maintenance
- the adjoining farming areas are sensitive to dust like vineyards, orchards, crops, livestock etc
- high vehicle operating costs due to the poor ride conditions.

Type of seal	Graded seal	Single seal	Primer seal
Year 0	Graded seal	Prime & 14mm seal	14mm primer seal
Year 1			7mm seal
Year 6		7mm seal	
Year 10			14mm seal
Year 12	14mm seal	14mm seal	

**Table 1:** Typical lifecycle of COLAS Graded Seals compared to conventional seals

**COLAS Graded Seals are more cost effective than traditional primer seals or single sized seals for surfacing gravel roads:**

- more durable because the graded aggregate forms a strong interlock and the crumb rubber modification of the binder makes the seal more robust,
- provides a longer service life before it needs to be resealed.

COLAS Graded Seals can also be used to surface haul roads, forestry roads, utility service roads and temporary deviations.

## COLAS GRADED SEAL IS EASY TO CONSTRUCT

COLAS Graded Seal requires minimum base preparation. However, the performance of the graded seal depends on the quality of the base. Once the base has been shaped and compacted, the semi-priming crumb rubber modified binder or high float emulsion is sprayed. If the gravel surface is dry, then it will need to be dampened with a water truck to avoid pin holing.

The graded aggregates are spread over the freshly sprayed cutback binder or high float emulsion and rolled with pneumatic tyred rollers. Stop rolling once the binder has migrated to the surface. Any loose aggregates must be swept back onto the fresh binder. Do not sweep the surface after rolling.

Graded seals will be sensitive to vehicle braking and turning actions in their early life while the binder is still curing. The soft binder is self-healing and repairs are easy to carry out on damaged areas.

## MAKE YOUR GRAVEL ROAD NETWORK MORE SUSTAINABLE

Surfacing your gravel roads with COLAS Graded Seals will not only reduce your maintenance costs but will preserve your scarce gravel sources, reduce the generation of dust pollution and prevent the erosion of large quantities of gravel into the ocean.

At COLAS we are all about delivering safer and more sustainable solutions for constructing and maintaining your road network. Contact your local COLAS office to find out how to deliver Otta seals in the most cost-effective way to suit your budget and resources.





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