

GRAVELOCK Questions & Answers

What is GRAVELOCK?

GRAVELOCK is a manufactured liquid compound, which is mixed with compaction water and added to the road either during construction or onto an existing scarified road. Gravelock technology locks gravel into the road base and so reduces gravel loss, or reduces the need for gravel during the initial construction by enabling the use of local soils.

How does it do this?

GRAVELOCK is designed to increase the osmotic and matric suction of typical clay based soils while reducing moisture susceptibility. It is this behavior that increases the strength and stiffness of typical clay based sub-grade soils. At the same time it locks in the gravel to minimize gravel loss and provides a road with good trafficability in wet weather. Dust is also reduced.

MATERIAL:

What type of soil type works best with GRAVELOCK?

GRAVELOCK will improve most soil types, however best results are achieved in cohesive soils with clay content of 10% or more.

How do we determine if our material is compatible?

Samples should be taken and subjected to a hydrometer test, grain sieve analysis and Atterberg Limit evaluation. These tests enable us to tell whether any gravel or clay needs to be added to the soil or if the existing material is suitable.

How well does GRAVELOCK work with highly plastic clays and/or Asphalt?

GRAVELOCK works very well in highly plastic soils and reduces it's shrink/swell characteristics GRAVELOCK is effective with milled asphalt provided it is broken down to 20mm or smaller particle size.

PREPERATION:

How much prep time is needed?

There is a distinct improvement in the workability of the soil after applying GRAVELOCK. This saves time when grading and placing the soil. During the compaction stage, the number of passes required with the various compactors is reduced- often up to 50%.

What do we have to do to prepare our road surface for treatment with GRAVELOCK?

Prepare the road by clearing the ditches and pulling shoulders, shape the road. Scarify the road to a depth of 20 cm.

What do we do with existing soft spots or frost boil?

In most cases the areas should be excavated and backfilled with appropriate pit run material then apply geotextile before placing subgrade.

Some roads have poor drainage; will this effect the end result?

Yes, it will. Good drainage is vital to extending the life of any road. Proper drainage must be provided on either side of the road.

Is a suitable surface crown important?

A suitable crown is vital for the longevity of a road. It is essential that a crown of 4% be maintained on a road.

Are Gravelock roads guaranteed?

Due to the following potential scenarios no guarantees are stated or implied:

- Material inconsistencies.

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- Subgrade inconsistencies
- Water damage
- Improper application
- Weather
- Traffic

How much road can be done in a day?

This is dependent upon the amount of equipment used, the skills of the operators and the types of equipment. It is generally to be considered be 800 to 1600 meters per day. Road width must be taken into consideration.

How deep do you normally go?

For the best results and dependent on traffic the GRAVELOCK structure should be about 20 cm thick.

APPLICATION:

How is GRAVELOCK applied?

- Prepare the road by clearing the ditches and pulling shoulders, shape the road.
- Scarify the road to a depth of 20 cm.
- Add the GRAVELOCK to the water in the spray truck and spread evenly over the scarified area. Add more water if necessary to bring moisture content of the soil to just above OMC.
- Mix the scarified layer with the grader or other equipment to ensure the moisture content is even through the layer.
- Shape and compact the road.
- Finish rolling the surface with a pneumatic roller.
- Spray a small amount of clean water onto the finished treated surface once a day for three days.

How much water is required?

Add sufficient water to raise the moisture content to OMC +1-2%.

Why do you need so much water?

It helps to migrate the product through the soil

Can less water be used?

No.

Can we pack 20cm of material at one time?

No, it needs to be compacted in 5-7cm layers at a time.

Do we need to add water when packing?

Yes, depending on the moisture content of the soil. If the soil dries out because of weather and wind, the lost moisture needs to be replaced.

Will you show us how to do the application?

Yes.

Application to an existing road ?

GRAVELOCK can be applied to an existing road surface to prevent rutting, gravel loss and provide dust control without rebuilding the road. The correct amount of GRAVELOCK is applied

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with a water tanker in three or four applications. It penetrates the soil and reacts sufficiently to correct these problems.

EQUIPMENT:

What equipment do we need?

Typically the following are used:

- 1 Rotor mixer
- 1 Water Tanker with spray bar (100 barrel capacity or larger)
- 1 Grader with ripper teeth (Preferably two units)
- 1 Pad foot compactor
- 1 Wobbly Roller
- 1 Disc plow with tractor
- Good Operators for this equipment

What if we don't want to do it ourselves?

A construction company may be recommended.

FINISHING:

What does the finished road look like?

It will look like a gravel road with the gravel bound into the surface.

Will the road surface be smooth?

This will depend on the skill of the grader operator. For the best results use a knowledgeable, experienced operator.

Why do some GRAVELOCK roads have many check board type surface cracks?

The road surface may shrink and crack through the curing process as the soil dries out.

Is it recommended to chip/seal the surface?

It is optional, but not necessary.

Would you recommend a double chip seal?

It is recommended, rather than a single application.

How soon after construction can vehicles drive on the surface?

Immediately.

Are there significant measurable changes in the CBR value?

Yes, up to a ten-fold increase has been found.

Do you need to repeat the treatment?

The reaction of GRAVELOCK with the clay particles in the soils is permanent. Some existing roads have been in use for over 20 years and have shown little or no deterioration over this period. If treatment is required at all, it would only be if additional material is imported.

MAINTENANCE:

Will a GRAVELOCK road crack, if so how do we repair them?

There will be small shallow shrinkage cracks, which will not break out. No repairs are necessary.

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What about potholes?

Potholes must be removed during the initial road construction phase. If the potholes are not fixed water will collect, soften the soil and then the pothole will continue growing causing failure.

Re-grading or repairing a treated road?

To repair damage in a road that was previously treated with GRAVELOCK, merely wet the surface, re-grade and ensure that the material pushed to the side is replaced onto the road. The soil will be compacted by machine or by traffic forces.

KEY BENEFITS:

What are some of the key benefits to using GRAVELOCK?

- Saves money
- Reduces gravel loss
- Reduces maintenance
- Preserves gravel (Non-renewable resource)
- Increases soils density, strength and stiffness
- Sheds water
- Mitigates the re-adsorption of water into the road over time
- Reduces dust
- Improves the trafficability in wet weather
- Long term treatment (Does not have to be repeated yearly)
- Preserves clay caps

Wet Conditions?

The treated soil or road surface becomes hydrophobic or water repellent. The soil does not deteriorate in wet conditions, resulting in improved trafficability.

Dust?

Dust diminishes by up to 90%, depending on soil type. This reduces the need for frequent grading and other maintenance, resulting in cost savings and safer driving conditions.

SAVINGS

What is the savings using GRAVELOCK?

Application of GRAVELOCK modifies the compactibility of locally available soils for road construction. The cost of GRAVELOCK is usually significantly less than the cost of hauling gravel to modify soils. In Canada, the counties in Alberta have found that after treatment with GRAVELOCK, the payback from reduced maintenance costs is less than 18 Months.