

Environmentally Friendly, Non-Hazardous
Granitic Sand Stabilizer &
Dust Control Solution.



The ideal solution to
stabilise crushed rock,
decomposed granite and decco.

**Environmentally Friendly, Non-Hazardous, Australian Made Stabiliser/Binder for
Granitic Sand, Decomposed Granite, Sandstone or Crushed Rock,
Paths, Tracks, Unsealed Roads, Carparks & more**

Soilbond[®] Application
Manual for
Granitic Sand Stabilisation
Version 8.0

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1. What is Soilbond A01?

Soilbond A01 binder is a water based organic emulsion used for the stabilization of granitic sand based pavement materials.

The active ingredient in Soilbond A01 is a naturally derived sticky material that provides the binding properties of Soilbond.

Soilbond is environmentally safe, classified as non-hazardous and non-dangerous good. This means it is safe for handling, storage and transportation as with all products, please refer to the Material Safety Data Sheet before use.



2. Weather condition required for Soilbond A01 stabilisation

Soilbond A01 should be applied ideally on a day without rain.

3. Pathway stabilisation with Soilbond A01 is used to:

- increase cohesion of granitic sand;
- provide reduced moisture susceptibility;
- improve pavement strength;
- bind the fine particles to improve dust control;
- reduce the problems associated with material that deform and shove when subjected to traffic.

4. The advantages of using Soilbond A01 may be in the following applications:

- Pedestrian or cycle trafficked pavements susceptible to mechanical erosion;
- Areas subjected to flooding or rain erosion;
- Dust control improvements for pavements in sensitive areas;
- Improving the load carrying capacity of a pavement;
- Where life cycle costs can be minimised as an alternative to regular maintenance schedules.



5. Things to be aware of when stabilising with Soilbond A01 – Optimum Moisture Content

5.1 Optimum Moisture Content (OMC)

In the field to achieve the maximum density or the maximum compaction of the soil, a combination of water and compactive effort is required.

The compactive effort is supplied by the compaction equipment. This is determined by the number of passes of the roller of a certain type and weight. (Developments in Road Stabilisation, 2001)

The water content or optimum moisture content (OMC) can be determined using the 'hand clench' test.

1. Pick-up a handful of soil;
2. Squeeze it in your hand to form a lump;
3. Open your hand.

Drier than OMC	If the lump cannot be formed by squeezing in the hand without disintegration the material is too dry for compaction.
At or near OMC	If the lump is formed and firm and can be thrown up and down in the hand the moisture content is close to the optimum and ready for compaction.
Wetter than OMC	If the material flows, it is too wet.



Close to optimum and ready for compaction

**Dilute 1 part Soilbond® A01 with
1 part water**

Note: Soilbond A01 is a liquid and will contribute to the moisture required for OMC.

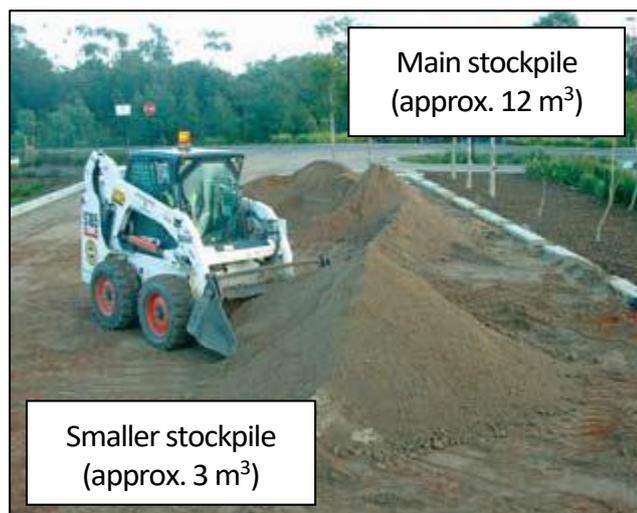


6. Mixing Soilbond into a granitic sand stockpile prior to laying the granitic sand.

Dilute 1 part Soilbond® A01 in 1 part water

Note: Soilbond A01 is a liquid and will contribute to the moisture required for OMC.

From the main stockpile, create a new, smaller pile that can be mixed easily with the equipment available.



6.1 How much Soilbond A01 will I need to add to the stockpile?

Example: Soilbond A01 is to be added to a granitic sand stockpile unit of 1 m³.

Volume of loose soil stabilised		1 m³
Density of granitic sand	1.6 t/m ³	
Tonnes of Material (Uncompacted) to be stabilised	Tonnes = 1.0 m ³ x 1.6 t/m ³	1.6 tonnes
Soilbond A01 application rate	2%	
Amount of Soilbond required for project	0.02 x 1.6 tonnes	0.032 tonne or 32 kg or 32 litres



6.2 Applying Soilbond A01 to stockpile and mixing

Step 1: The stockpile is flattened and some Soilbond A01 is sprayed onto the surface.



Step 2: Mixing using the bobcat commences.



Step 3: As the granitic sand is turned over further Soilbond A01 is added to the turned over material and the stockpile.



Step 4: Mixing continues.





Step 5: Turning over the material mixing in Soilbond A01.



Step 6: The required amount of Soilbond A01 is added gradually whilst mixing occurs.



7: Once all the required Soilbond A01 is added to the stockpile, mixing continues to ensure uniform distribution.



Continue mixing until the binder has consistently coated the material and uniform colour is achieved.



7. Things to be aware of when mixing Soilbond A01 into granitic sand stockpile

Note: Dilute 1 part Soilbond® A01 in 1 part water

7.1 Knowing how much Soilbond A01 has been sprayed on: 200 Litre drums

The 200 L drums do not have a visual measure of the quantity whilst spraying. It is therefore best to spray the full drum onto a stockpile. Example: a 200 L drum is to be used to treat a stockpile. What size stockpile is required?

Amount of Soilbond		200 L
Soilbond application rate	2%	
Kilograms/tonnes of compacted soil stabilised with 200 litres of Soilbond A01	200 L	10000 kg or 10 tonne
Density of granitic sand	1.6 t/m ³	
Volume of compacted soil to be stabilised	10 tonne ÷ 1.6 t/m ³	6.25 m ³

7.2 Lumps

Lumps of granitic sand need to be broken up to ensure the Soilbond A01 mixes even throughout the granitic sand. Lumps can be broken up during the mixing process by running over them with a bobcat.



Lumps of granitic sand within a stockpile



7.3 Optimum moisture content

Mixing granitic sand on a stockpile, and transporting to the construction site to be laid can result in drying out of the granitic sand. It is important to ensure that prior to compaction the optimum moisture content is reached. (Refer to section 5)

This may require the addition of water to the Soilbond A01 treated granitic sand prior to compaction.

8. Insitu Stabilising

Insitu stabilisation using Soilbond A01 may consist of:

- A. applying Soilbond A01 to an existing granitic sand path; or
- B. applying Soilbond A01 to a loose granitic sand spread during the construction of a granitic sand path;

Option A - Create stockpile of Granitic sand from existing material.

(refer to Section 6 above for stockpile mixing)



Existing granitic sand pathway



Mix Soilbond into granitic sand

Option B - Rip/disturb the granitic sand to stabilisation depth.

(refer to Sections 8.2 & 9.3 below for Insitu mixing)



Surface ready for granitic sand



Excavate to required depth



8.1 How much Soilbond A01 will I need to stabilize a granitic sand pathway

Dilute 1 part Soilbond®A01 in 1 part water

Example: A section of a granitic sand path is to be stabilised with Soilbond A01. The section is 100 m in length and 2m wide. It is to be stabilised to a depth of 50 mm.

Volume of compacted soil to be stabilised <i>Note: Volume Prior to Compaction</i>	Volume = length x width x height = 100 m x 2 m x 0.050 m	10 m³
Density of granitic sand	1.6 t/m ³	
Tonnes of compacted soil to be stabilised	Tonnes = 10 m ³ x 1.6 t/m ³	16 tonne
Soilbond A01 application rate	2%	
Amount of Soilbond required for project	0.02 x 16 tonne	0.32 tonne or 320 kg or 320 litres

8.2 Method using Soilbond A01 for insitu stabilisation

Step 1: Rip/disturb the granitic sand to stabilisation depth.

Various equipment can be used ie. rake, rotary hoe, bobcat, profiler etc.



Step 2: If required, water can be added to moisten granitic sand.

Granitic sand may be thoroughly wet from rain. The wet granitic sand assists in the even distribution of the Soilbond A01.



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Step 3: Mix water into granitic sand to the stabilisation depth to ensure even distribution of water.



Step 4: Cover edges, gutters, walls etc with plastic or tape before spraying Soilbond A01. Spray Soilbond A01 directly onto surface.



Step 5: Mix Soilbond A01 into granitic sand.

The same equipment as Step 1 can be used for mixing.



Step 6: Compact at OMC

Roller or Wacker plate compaction is acceptable.





9. Maintenance of an existing granitic sand path

Note: Dilute 1 part Soilbond® A01 in 1 part water

9.1 Soilbond A01 and resheeting

1. Lay the loose granitic sand resheet on the existing path
2. Rip/disturb the path to the depth of stabilisation

Follow the procedure for insitu stabilisation outlined in Section 8.2.

9.2 Patching

1. Place untreated moist granitic sand into the hole
2. Apply Soilbond A01 and mix in
3. Compact into hole

OR

1. Place moist Soilbond treated granitic sand into the hole
2. Compact into hole

9.3 Spraying on Soilbond A01

9.3.1 Knowing how much Soilbond A01 to apply:

For small scale jobs, watering cans can be used to apply Soilbond A01.



Example: A 10 Litre watering can is to be used to treat a granitic sand path with Soilbond A01. The path is 2m wide and is to be stabilised to a depth of 50 mm.

What length will the 10L watering can of Soilbond A01 treat?

Amount of Soilbond		10 Litres
Soilbond application rate	2%	
Kilograms per tonnes of compacted soil stabilised with 200 L of Soilbond A01	$10 \text{ L} \div 0.02$	500 kg or 0.50 tonne
Density of granitic sand	1.6 t/m^3	
Volume of compacted soil to be stabilised	$0.50 \text{ tonne} \div 1.6 \text{ t/m}^3$	0.31 m^3
Length to be treated	Length = Volume \div Width \div Depth = $0.31 \text{ m}^3 \div 2 \text{ m} \div 0.050 \text{ m}$ Uncompacted Depth	3.1 m or (6 m ² to a depth of 50 mm Uncompacted)



9.3.1.1 200 Litre drums

The 200 L drums do not have a visual measure of the quantity whilst spraying. It is therefore best to spray the full drum onto the section to be treated.

Example: A 200 L drum is to be used to treat a granitic sand path. The path is 2 m wide and is to be stabilised to a depth of 50 mm. What length will the 200 L drum of Soilbond A01 treat?

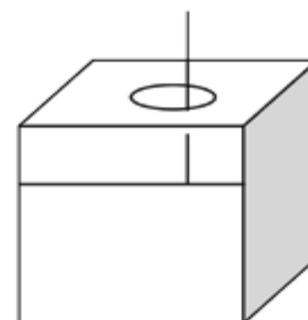


Amount of Soilbond		200 Litres
Soilbond application rate	2%	
Kilograms/tonnes of compacted soil stabilised with 200 litres of Soilbond A01	$200 \text{ L} \div 0.02$	10000 kg or 10 tonne
Density of granitic sand	1.6 t/m^3	
Volume of compacted soil to be stabilised	$10 \text{ tonne} \div 1.6 \text{ t/m}^3$	6.25 m ³
Length to be treated	Length = volume \div width \div depth	62.5 m or (125 m ² to a depth of 50 mm Uncompacted)

9.3.1.2 1000 Litre IBCs

The IBCs have a measuring rule on the side. It is difficult however to know the level within the IBC using this scale.

Ideally a dipping stick is required that can record the level against the scale on the side of the IBC.



Note: Dilute 1 part Soilbond® A01 in 1 part water



9.3.2 Technique for spraying Soilbond A01 into the surface:



Side to side spraying using a hand lance ensuring coverage of the granitic sand path



It is important that the edges are thoroughly coated with Soilbond A01

Even distribution of Soilbond A01 over the surface

Important tips:

- Ensure edges, gutters, walls etc are covered prior to spraying with Soilbond A01
- Ensure even distribution of Soilbond A01 over the surface
- Ensure the edges are coated with Soilbond A01
- It is important that the required amount of Soilbond A01 is sprayed onto the area
- If you spray Soilbond A01 over the surface and find that at the end you have not applied enough, respray the entire area with the remainder required



9.3.3 Mixing Soilbond A01 into the granitic sand:

It is important that the Soilbond A01 sprayed onto the surface is mixed to the required depth to ensure coating of all granitic sand particles, ensuring stabilisation of the path.

Important tips:

- Mix to the required stabilisation depth
- Ensure thorough mixing of edges
- Ensure thorough mixing to ensure distribution of Soilbond A01 to the sand throughout the stabilisation depth
- Continue mixing until you achieve uniform colour and even distribution throughout the granitic sand.
- It is better to apply too much than not enough





10. Troubleshooting

10.1 The soil is too wet

Depending on the climate, the granitic sand can be quite wet.

- Soilbond A01 is a liquid and when applied to an over wet surface will increase the wetness further
- Excessive moisture in the soil can hinder the operation of equipment

In a situation where the granitic sand is wet, apply and mix in lime to dry out the soil. After a workable moisture content is attained, rip/ disturb the granitic sand to the stabilisation depth and apply Soilbond A01 as per instructions.

10.2 Further Soilbond is required after compaction

A miscalculation of the Soilbond required to stabilise a granitic sand path can be corrected even after curing has occurred.

1. Rip the granitic sand path to the stabilisation depth
2. Ensure the sand is moist
3. Spray the additional Soilbond A01 correcting the deficiency
4. Mix thoroughly
5. Ensure the sand is at OMC
6. Compact

10.3 The finished surface after compaction and curing is not level

Levelling the surface can be achieved by:

1. Introducing untreated granitic sand
2. Using machinery to level the Soilbond A01 stabilised path by disturbing and levelling a thin layer on the surface e.g. a levelling bar or bobcat bucket

In both situations, additional Soilbond A01 should be sprayed on loose material introduced or disturbed from the path.

The Soilbond A01 should be mixed into the loose material and compacted at OMC.

Note: When spraying Soilbond A01 onto surface loose material, it should be mixed immediately and compacted at OMC. If left to sit on the surface it can discolour the surface of the granitic sand path.



11. Cleaning

11.1 Surfaces

Prior to the application of Soilbond A01, edges, gutters, walls etc., should be covered with tape or plastic.

If Soilbond A01 splashes on these surfaces, immediately clean with a cloth and water.

If the Soilbond A01 dries, it requires a degreaser, kerosene or other liquid hydrocarbon solvents to remove the dried residue.

11.2 Equipment clean up

Clean equipment in contact with the Soilbond emulsion immediately after use.

Use water to wash fresh Soilbond emulsion out of equipment.

Wash water should be kept out of storm water and waterways.

If the emulsion has dried, it is recommended to use a water based caustic industrial degreaser designed to remove oil, tar and grease. Refer to the supplier's instructions for correct cleaning procedure. When a degreaser is used for cleaning, the waste water will be contained according to the local regulations.



12. Quick guide: how much Soilbond will I need?

12.1 Mixing ratio

Important: Soilbond needs to be added at a ratio of 2% to the dry weight of the material being treated.

Therefore 200 litres Soilbond or 200 kg needs to be mixed into 10,000 kg of material.

If you add water at the same time to make mixing easier, this is fine as long as 200 kg of Soilbond is added to 10 tonne or approximately 6.25 m³ of material.

Note: Soilbond is a liquid and will contribute to the moisture required for Optimum Moisture Content (OMC)

Example 1. Stabilisation of granitic sand

Amount of Soilbond		200 litres
Soilbond application rate	2%	
Kg/tonnes of compacted soil stabilised with 200 L of Soilbond	$200 \text{ L} \div 0.02$	10,000 kg or 10 tonne
Density of granitic sand	1.6 t/m ³	
Volume of compacted granitic sand to be stabilised	$10 \text{ tonne} \div 1.6 \text{ t/m}^3$	6.25 m ³

Mixing Ratio Table:

Dry weight of compacted granitic sand * Based on compacted density of material 1.6 t/m ³	Soilbond required
1 tonne or 0.6 m ³	20 litres or 20 kg
1.6 tonne or 1 m ³	30 litres or 30 kg
5 tonne or 3 m ³	100 litres or 100 kg
6 tonne or 3.6 m ³	120 litres or 120 kg
8 tonne or 4.8 m ³	160 litres or 160 kg
9 tonne or 5.4 m ³	180 litres or 180 kg
10 tonne or 6 m ³	200 litres or 200 kg
15 tonne or 9 m ³	300 litres or 300 kg
20 tonne or 12 m ³	400 litres or 400 kg



Example 2. Stabilisation road material

Amount of Soilbond		200 litres
Soilbond application rate	2%	
Kg/tonnes of compacted soil stabilised with 200 L of Soilbond	$200 \text{ L} \div 0.02$	10,000 kg or 10 tonne
Density of compacted material	2 t/m^3	
Volume of compacted granitic sand to be stabilised	$10 \text{ tonne} \div 2 \text{ t/m}^3$	5 m^3

12.2 Coverage

Stabilising an area of 1000 m^2 to a depth of 50mm (**Prior to Compaction**) would require approximately 2000

Volume of compacted soil to be stabilised	Volume = length x width x height = $50 \text{ m} \times 20 \text{ m} \times 0.05 \text{ m}$	50 m^3
Density of material	2 t/m^3	
Tonnes of compacted material to be stabilised	$\text{Tonnes} = 50 \text{ m}^3 \times 2 \text{ t/m}^3$	100 tonne
Soilbond application rate	2%	
Amount of Soilbond required for project	$0.02 \times 100 \text{ tonne}$	2 tonne or 2000 litres

Soilbond is available in 20 litre, 200 litre and 1000 litre containers

For further assistance please contact us as follows:

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