

INTRODUCTION AND INSTRUCTIONS FOR THE SPRAY-ON APPLICATION TECHNIQUE OF EL-SSS ON 1000m² SECTION

1. INTRODUCTION

EL-SSS has been successfully developed and is being manufactured in South Africa since 2001. EL-SSS has been supplying the international market ever since.

EL-SSS Technology has been developed in South Africa by a team of professional soil specialists, chemists, geologists and civil engineers. To date, more than 100 countries have utilized our EL-SSS Technology very successfully in providing and constructing low cost, all-weather roads (fully sealed and gravel roads) by stabilizing both in-situ (topsoil and clay soils) and/or borrowed natural soils.

EL-SSS is a technology used for the treatment of “poor” in-situ soils. EL-SSS optimizes the quality of the sub-grade materials utilized in the greenfield projects. Projects where EL-SSS has been successfully used include but not limited to road construction, road rehabilitation, maintenance of paved/unpaved roads, railway line soil stability, military airports, haulage roads, oil drilling platforms, renewable energy plants and farms, harbours and other infrastructure where a high degree of compaction is required.

EL-SSS has been formulated so as not contaminate the environment whatsoever, in other words: it is an ecologically friendly and safe product.

Benefits and Primary uses of EL-SSS:

- Optimizes bearing capacity, workability and performance of subgrade natural materials;
- Minimizes gravel loss;
- Minimizes road maintenance;
- Reduces lime/cement requirement by 40% on the traditional lime/cement stabilized layers;
- Increased flexibility and load bearing capacity (CBR);

- Optimizes costs of construction and maintenance of the various infrastructure;
- Protects government and private sector investment.

2. CONSIDERATIONS AND APPLICATION:

This is purely for illustration and example purposes.

This paper refers to our recommendations for the application of EL-SSS as surface area of 100m long x 10 m wide life span extender - in order to prevent and minimise surface damage in wet conditions.

STEP 1 - Visual evaluation of the soil to be used/stabilized with EL-SSS

- Identify the soil surface that needs to be treated.
- Make certain the soil is not wet or humid but fully dry.
- Dig a square hole with a spade on the ground of say 200mm x 200mm x 150mm deep.
- Take a handful of the soil from the bottom of the hole.
- Stand back from the hole and people (10 to 20m away).
- Raise your arm (with the handful of the soil) parallel to the road, shoulder height.
- Drop the soil from the hand and observe the outcome. If there is dust it indicates sufficient fines thus the soil is suitable to be stabilized with EL-SSS.
- If there is no dust whatsoever, then this indicates that the soil has too much stone and gravel and no fines and thus meaning that we will need to bring in fine material and that extra labour to import from the sides of the road.
- Please move away from the hole and identify suitable soil on the side of the road surface and do the same test. Removing plants and/or any vegetation growth if necessary.

STEP 2 - Site Preparation

Ensure that geometry and drainage is adhered to the road construction safety standards, at all times. Ensure final levels are accurate and accommodating for stormwater drainage off the road surface.

STEP 3 - Application of EL-SSS, spray-on technique

Calculation example portrayed below

Project: Section 100m x 10m wide area.
Soil: Natural soil consisting of at least 10% of fines
(0.425m...0.075mm soil grading)

Product to be used: EL-SSS.

Quantity of EL-SSS: 10 litres.

Water: 2 500 Litres.

Yield: 1000m² (1L of EL-SSS yields 100m²)

STEP 4 - Handling EL-SSS before the preparation of dilution in the water tanker or sprayer.



Figure 1 - Roll the barrel forwards and backwards

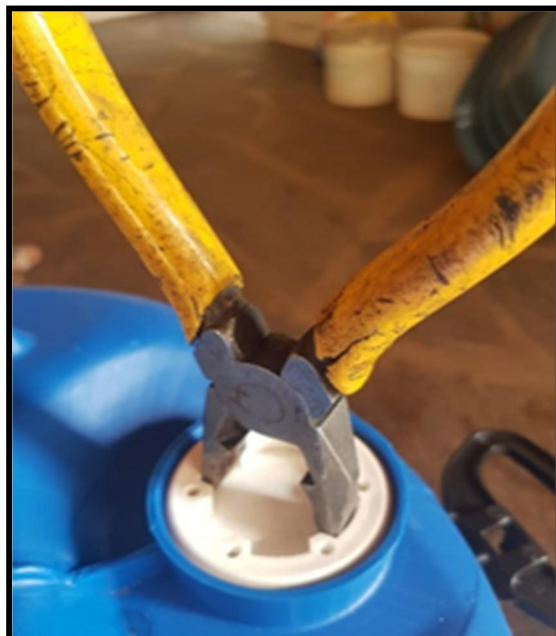


Figure 2 - Remove child-proof lid

- Roll drum forward and backwards 3...4 times on its side.
- Open child-proof-lock lid after removing metal seal cap.

Safety Comment:

Our hands have been in direct contact with the concentrated product for more than 20 years, no health issues related to the exposure or contact with the liquid. For those with sensitive skin, we recommend that gloves be used for protection purposes. See SDS certificate for ease of reference.

STEP 5 - Preparation of EL-SSS

- Each tanker/dilution takes no more than 15 minutes to mix.
- Field Appl. rate: Maximum 0.01 Lt (10ml) or 10 Lt diluted water per m².

Water Tanker methodology:

Fill tanker with 10 000 Lt of water, first!

(Ensure that tanker is filled on a level surface in order to get accurate measurements).

Pre- Dilution:

Dilute EL-SSS 10Lt (2x5Lt) or 10lt (2x5Lt) Water in a bucket, Prior to adding it into tanker water. (Figure 1 below)

Dilution:

Add pre-dilution / pre-diluted water into the 10 000 Lt of water in the tanker, as indicated in Figure 2 below.



Figure 3 - Pre-dilution



Figure 4 - Dilute pre-dilution into tanker

Mix well:

Move the water Tanker forward and backwards a number of times for the solution to mix well. The EL-SSS dilution is now ready, DO NOT SPRAY until work preparation is complete.



Figure 5 - Tanker EL-SSS diluted water solution



Figure 6 - 100 m x 10m = 1000m² demarcated marked area to spray

UNDERSTANDING THE EL-SSS CONCEPT FOR SPRAY-ON APPLICATION:

Normally unpaved road surfaces, parking facilities, airstrips, etc., are generally in good condition relative to geometric and drainage functionality during dry seasons. However, the life span of these surfaces is very short and it lasts until the first rain downpour.

It is important to note that mechanical intervention in an existing road pavement (rip and/or scarify) always affects the existing natural structure and weakens the bearing capacity of any natural material, proving to be time consuming and a “fruitless expenditure”.

It is thus recommended that a preventative treatment with EL-SSS be performed prior to the rainfall season. This has proven to be the most economical practice as the curing will take place naturally without the need for the 5 day curing of the surface normal undiluted water.

PROCESS OF APPLYING EL-SSS DURING RAINY SEASON

STEP 1

Measure and mark the area of 1000m² to be treated as shown in figure 6 above. The area consists of clayey in-situ material and is treated with EL-SSS to be utilized safely in the raining season.

STEP 2

Application of EL-SSS utilizing the “spray-on technique”

SPRAY 1 (First spray run): The marked surface of 1 000m² (Fig 6) is treated by means of spraying evenly 1/3 of the dilution prepared in the tanker over the entire area. It is advised to spray this in the morning. If the surface dries rapidly, Spray 2 may be sprayed immediately after.

SPRAY 2 (Second spray run): The marked surface of 1 000m²(Fig 6) is treated by means of spraying evenly 1/2 of the remaining diluted water in the tanker over the entire area. It is advised that this be done at mi-day. Again, if the surface dries out quickly, you may commence with spray 3.

SPRAY 3 (Third Spray run): The marked surface of 1 000m²(Fig 6) is treated by means of spraying evenly the remaining solution in the tanker over the entire area. This can be done during the afternoon (14h00 to 15h00).

Ensure that the solution does not run-off into the road sides (make certain the solution is being saturated in the soil and not to the sides of the treatment area due to steep slopes and chamber). If this happens, reduce spray flow or ensure that there are no dry spots on the surface.

Remember to close / stop spray during the water tanker idol, u-turning or maneuvering every strip turn-around.



Figure 7 - Spray-on technique of EL-SSS with tanker

The road section can be open for traffic immediately after spray 3 as the vehicle traffic will help compaction. Please make sure that the road is not too slippery for vehicle traction after spray 3.

STEP 3

The treated EL-SSS road/surface needs to be cured with maturation moisture over the following 5 to 7 days. This involves watering the surface with water only once a day if there is no rain. This is vital and of high importance to take place.

EQUIPMENT

No special equipment is required to carry out this work. The standard road construction water tanker equipped with a distributor spray pipe is suitable for the application of EL-SSS. In addition, The Youth Mall (Pty) Ltd manufacture various “small-size” equipment such as 2 000L water bowsers which can be utilised for both fire-fighting and EL-SSS soil treatment of road works. It comes equipped with a pump. The spray arm to be purchased separately. Please contact The Youth Mall for any further information in this regard.



Figure 8 - ELSSS 2000L Water Bowser



Figure 9 - 3.5m wide hook-up grader

TESTING

All in-situ tests apply to evaluate the improvement of EL-SSS treated materials. Laboratory tests can be conducted on treated soils. Soaking tests are not applicable in this case.

Tests should be conducted 20 to 30 days after treatment. Tests conducted within 24 hours after the application may not be suitable indicative of the product results. EL-SSS is a liquid stabilizing agent, NOT a hydraulic binder or powder product.

CONCLUSION:

EL-SSS treated layer/s have the capability of adjusting its bearing capacity under constant traffic action. Over time, the product infiltrates and seeps downwards into the underlying soil strata (natural soil), forming a thicker and strengthened stabilized layer.

Please do not hesitate to contact us for more information:

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