

PolyCom Methodology

Manufactured by:



BioCentral Laboratories Limited
22 Phillips Street, THEBARTON,
SOUTH AUSTRALIA, 5031
P: +618 8234 8886
E: info@biocentral-labs.com
www.biocentral-labs.com
www.roadmaker.com.au



Distributed by:

ZAC
Siege Social Lot 809
Assinie Mafia
+225 8701 1900
RC Nr: Cl. Grand Bassam
2017. PO. 251
Nr Cpte Cont: 1712382 T
www.zac.ci

1. PolyCom Stabilisation Aid

PolyCom stabilising aid offers a versatile, cost effective and environmentally safe option for infrastructure needs in the areas of road construction, repair and maintenance.



2. Construction – Costing

- PolyCom can offer a range of construction solutions.
- PolyCom treated roads outperform untreated roads by a factor of 4 to 1 on average.
- One 2Kg Pack of PolyCom will treat 50M of road at 10M wide X 100mm depth.
- Depth of treatment will vary as per project requirement.
- The ratio of PolyCom to road material is the same for all materials and is fixed to provide optimum efficiency and outcomes.

3. Treating In situ Materials

Using PolyCom on roads is a straightforward and simple process. Below is a method statement which is a basic guide to the procedure.

4. Equipment:

<p>Grader with rear mounted scarifiers</p>	
<p>Suitable rollers to suit compaction depth (preferably a multi wheel roller)</p>	
<p>Water cart (water cart should have pressurised dribble bars and/or fan sprays)</p>	
<p>PolyCom Stabilising Aid</p>	

5. Preparation:

Ensure the area to be stabilised has been inspected and check to identify any underground utilities. Ensure that all workers have correct safety equipment and are familiar with the procedure about to be undertaken. A tool box talk at the start of the job is important so that all understand the work procedure.

6. Area Identification:

Mark the area to be stabilised. Generally, areas up to 500 cu/metres can be stabilised easily with standard equipment in one day. (10M wide X 100mm depth = 500M)

7. Ripping/ Scarification:

Opening up of the area with the grader will be required to allow mixing of the material. The intended stabilisation area needs to be prepared as per specification and not exceeding Optimum Moisture Content. Water only added at this stage to keep dust down.

Rolling of materials may also be required in order to break up lumps and achieve good sized aggregate distribution.

8. Optimising Materials:

During the filling operation of the water cart, mix at no more than 1kg Polycom to 6,000L of water in order to bring the material up to Optimum Moisture Content.

When PolyCom is applied to road networks, there is no material sent to waste. Using the naturally occurring fines, usually excavated to waste, to create a more tightly bound and longer lasting pavement.

Once PolyCom has been applied mixing with the Grader can commence, addition of PolyCom can continue as the grader windrows and spreads the material to form the crown and runoff.

9. Compaction:

The Multi Tyre Roller is the preferred option to achieve the best results.

As demonstrated in the previous picture, the independent nature of the tyres allows for any “soft spots” to receive additional force. This results in a more uniform compaction result especially during sub-base or natural ground stabilisation.

Polycom continues to gain in compaction past traditional methods. Additional rolling of 20-30% will result in measurable gains in density.

In the example below the PolyCom treated section lost significantly less material over a year than the untreated section. This equates to a quantifiable 1kg/m² compared to 10kg/m². Less dust and material wasted.

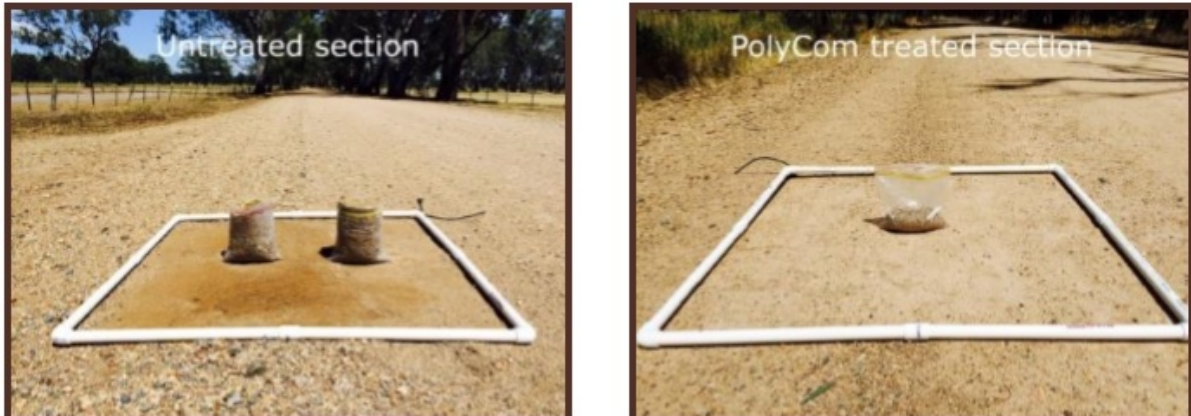


Figure 1: 1kg loose fines with PolyCom compared to 10kg from untreated section.

Treatment can also be provided to maintain existing pavement infrastructure. Below is an example from Western Australia where PolyCom protected the road from stripping and failure in high rainfall areas. PolyCom will more than pay itself off after the first significant rain event as the road closures will be minimised while minimising hydraulic damage to the driving surface.



Figure 2: PolyCom Treatment in (L) Western Australia and (R) Queensland, Australia protecting sealed pavement from damage during flood events.

10. Stabilise Materials

PolyCom has been trial proven by the Australian Road Research Board (ARRB) to be an effective and equivalent stabilisation to cement and lime. PolyCom offers an alternative to cement and lime stabilisation, for considerably less cost and effort.

In Figure 3 you will see a PolyCom shipment weighing little over 100kg and the alternative; a 4% cement treatment weighing over 100T and requiring 4-5 semi loads and equipment to handle. PolyCom is easily transported for little cost and effort.



Figure 3: (L) PolyCom (R) Cement logistical comparison for a 1km road.

11. Subgrade Stabilisation

Adopting a PolyCom Stabilisation treatment with subgrade formation will increase the pavement Subgrade CBR which can be adopted for a reduced pavement thickness design. A recent Tuscaloosa treatment in Alabama USA treating silty sand is an example of this.

In the Alabama example, an independently assessed CBR of 9 was given pre-treatment. One month after PolyCom treatment it was tested and found to have increased to a CBR of 30. Re-testing 6 months after treatments a value of 140 was generated. If a conservative subgrade improvement is applied to design the savings to conventional pavement construction is significant.

The ARRB (Australia Road Research Board) mechanistic pavement design table for standard pavements suggest with a subgrade CBR of 9 a pavement thickness of minimum 200mm is required. The blue line indicates the PolyCom treated subgrade with an adopted CBR of 30 can adopt a minimum 100mm pavement. A minimum 50% material saving.

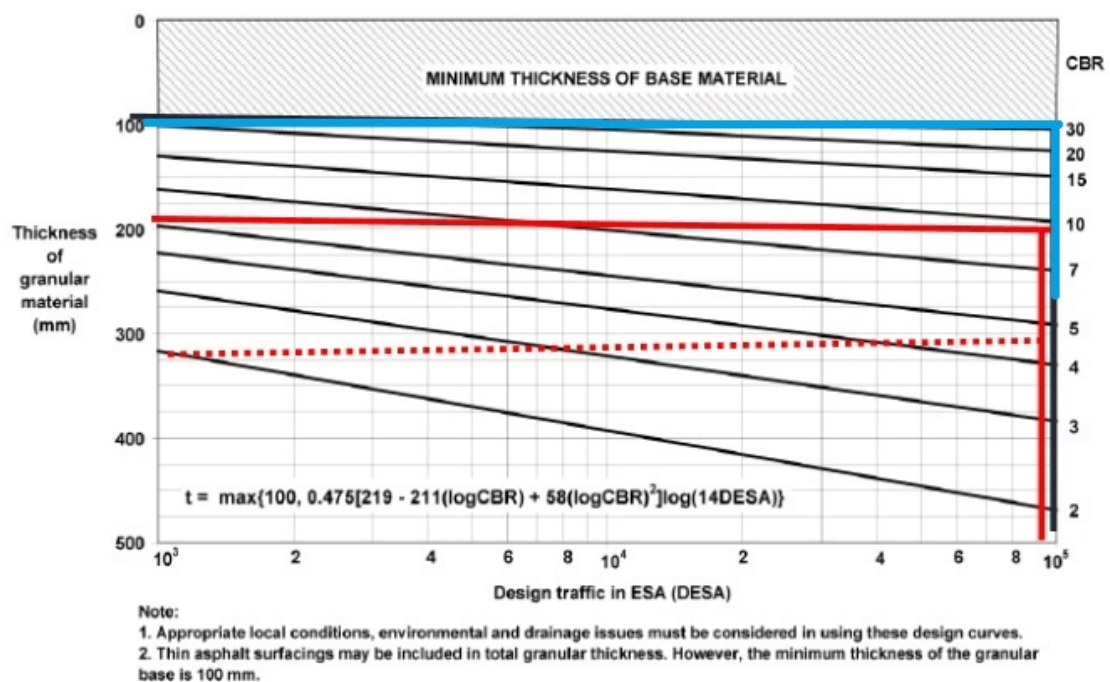


Figure 4: ARRB (Australia Road Research Board) Mechanistic Pavement Design determining pavement thickness based upon subgrade CBR

12. Competitor Analysis

	POLYCOM	GRT/POLYROADS	ECO BIND
Substrate application	YES	YES	YES
Surface application	Not essential	YES	NO
Prime Constituency	Polymer	Cement /Lime/ Flyash typically 60%	Bitumen – particulars unavailable
Application Concentration	Low – 0.02%	High – 3-6%	High – 3-6%
Specialist Application	Not Essential	Essential	Essential in part
Specialist Equipment	NO	YES	YES
Environmental Impact	Bio Degradable No systemic toxicity to aquatic or microorganisms	Core constituents have environmental impact.	Core constituents have environmental impact.
Cost	Low – Typically CFA1500/m ² for 100mm treatments. This cost will not significantly vary due to location.	Medium – Typically 2- 4 times PolyCom Cost. Will significantly vary depending on location. Will decrease with high volume applications.	Medium – Typically 2- 4 times PolyCom Cost. Will significantly vary depending on location. Will decrease with high volume applications.

****Please note that the competitor analysis is only done via Market Research and we do not take any liability as to the accuracy or completeness of any of the information contained in this Market Research table or in any other written or oral communication transmitted or made available to a recipient****

13. Frequently Asked Questions



1. Can a 2kg bottle of PolyCom replace 2-4 tons of cement or lime as a binding agent?

2kg of PolyCom is equivalent to 5 ton of cement at 5% ratio. Benefits of PolyCom are low cost of transport to site and weighs significantly less.

PolyCom resists cracking and is much safer to use with none of the associated risks to worker's health.

ARRB investigations and Tanami Trial, which explore these comparisons. The reports show PolyCom surpasses lime performance and at a minimum equals the performance of cement.

2. Can we apply this process to finished roads for improvement of lifespan, if so how does this work?

Yes.

The process is to incorporate PolyCom stabilization with the next planned maintenance. It is then applied as part of the standard pavement conditioning and compaction process. It can be included in Full Depth Pavement Reclamation – Stabilisation of existing asphalt pavement with sub-base and PolyCom for creating a stabilized base for new asphalt surface. PolyCom is used Australia wide for rejuvenating tired worn out asphalt pavements as well as adding longer life to new constructed roads.

3. Can we use this process for embankment of rural water tanks (ponds) and irrigation canals for bank stability and robustness? Erosion in embankments.

Yes.

Testing to determine the material treatment thickness, along with development of appropriate construction methodology. But in short dams can be easily constructed for a fraction of the cost of importing special clays and or specifying liners.

The Adelaide University Summary Investigation identified permeability in clay reduced by 85% so the opportunity for leachate containment in tailing dams

or landfills are significant. Landfills typically are capped by 1m of clay in Australia. This study identified that this could be reduced to 150mm equivalent – even if it is reduced to half the potential savings in reduced earthworks and increased capacity can be significant.

4. What are some of the benefits of PolyCom?

- By using PolyCom on a 50km road and reducing the maintenance program to once per year, this will free up approximately 1000 machine days annually for resources to be allocated elsewhere.
- Reduction in plant wear and tear
- Reduction in fossil fuel consumption
- Reduction in impact on existing network mobilising plant and materials
- Treatment will improve productivity as emergency call outs will be significantly reduced
- Significant improvement in pavement standard and safety