



CTN 14 - GATT Pavement Surfacing

Client Technical Note

GATT

GATT (Graded Aggregate Total Treatment) Pavement Surfacing is a product developed exclusively by Boral Asphalt in Australia and consists of a spread of graded aggregate on bituminous binder applied with hitech road surfacing equipment.

GATT was developed for the treatment of unsealed gravel roads with short, high demand routine maintenance cycles, but may equally be considered in lieu of other bituminous treatments on low to moderately trafficked roads in Australia. There are both rural and some metropolitan applications for the product.



Figure 1. Schematic of GATT process

GATT was first placed in Victoria, Australia in 1999 as a way to reduce whole of life maintenance cost on gravel roads plagued by nuisance dust and loss of base material through erosion and trafficking.

GATT is derived from similar treatments and processes that have been successfully used overseas since the early 1960s. The treatment may be considered as way to apply a thin asphaltic type surface using an in situ process that creates a mastic of bitumen, fines and small aggregate that is interspersed between the large aggregate of the graded aggregate surfacing.

ADVANTAGES OF GATT

GATT pavement provides a range of benefits to the local road authority, road user and community.

It turns gravel roads into bitumen roads, eliminates potholes and costly, interruptive ongoing maintenance as well as providing a safer and cleaner environment for the road user.

CTN 14

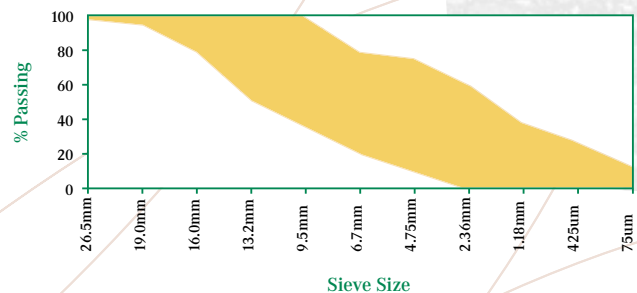


Figure 2. GATT aggregate broad grading envelope

The key benefits of GATT are summarised below.

- Reduces maintenance costs.
- Eliminates nuisance dust.
- Improves safety and amenity of a gravel road.
- A closed texture that provides a smooth riding surface.
- Reduces loose aggregate.
- Affordable alternative to other surfacings on a Whole Of Live Costing Basis
- Quality and performance similar to conventional bitumen surfacings.
- Ecological and environmental (uses natural or local gravels or by-products).
- Allows greater community acceptance of thoroughfare.
- Impervious and prevents water entering a susceptible base.
- Improved healing of surface where shear loads are applied at low frequency.
- Durable/less binder ageing.

LIMITATIONS

- No structural benefit.
- Not recommended for heavy traffic volumes or where regular high torsional shear loads occur.

GATT DESIGN

The aggregate grading envelope for GATT Pavement Surfacing is wide (Figure 2) but must be carefully interpreted to ensure that the application is successful. An appropriate grading curve must

be based on locally available aggregates and the viability of the spreading process.

Both cutback and emulsion bitumen binders are used in GATT Pavement Surfacing.

The binder base is either Class 50 or Class 170 and a broad range of application rates can be used depending on the level of dilution.

THE PROCESS

GATT Pavement Surfacing involves a two step process akin to other sprayed bituminous processes. First, binder is sprayed onto a suitable granular base at a metered rate.

Immediately afterwards, an approved aggregate is spread over the binder, generally using a specialised aggregate chip spreader for optimum performance.

The soft, low viscosity binder used, partly primes the granular base and also provides cohesion and adhesion in the mastic of fines and small aggregate that is interspersed between the large aggregate of the surfacing.

Multiwheel rollers are used to knead the aggregate into the binder. This kneading is also the mechanism by which binder is squeezed up through the aggregate to form mastic with fines and provide sufficient binder film thickness throughout.

Rolling creates a surface with an almost flush appearance albeit dull due to mastic rather than raw binder between aggregate, and the resultant surface texture is less than that of a sprayed bituminous seal.

THE GRAVEL ROAD BASE

Preparation of the gravel base is no different to that required for other bituminous surfacing and in some cases can be less onerous. The base should be rolled to give a tightly compacted finish, without any loose material at the surface.

The base should have a CBR in excess of 50% under equilibrium conditions but experience has shown that this bearing capacity can be relaxed if GATT is applied in dry climates and traffic volumes are low. For optimum performance, pavement materials may be dry to damp but not wet at the time of GATT application.

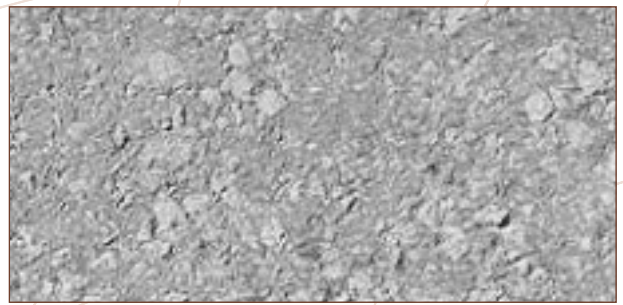


Figure 3. GATT surface.

APPLICATION

GATT Pavement Surfacing is an all year round treatment, on the proviso that it is not applied during, before or soon after rain. It should *not be* applied where frequent heavy axle manoeuvring loads are expected.



Figure 4. GATT aggregate spreader

Rates of coverage achieved with GATT are within the range used for other sprayed bituminous products.

As the aggregate in GATT is imbedded into the surfacing, there may be a need for sweeping after application.

GATT PERFORMANCE

Life expectancy of GATT Pavement Surfacing is:

- 5 to 6 years for single surface applications; and,
- 10 to 12 years for double surface applications.

FURTHER INFORMATION

Please contact Boral Asphalt

Phone (03) 9508 7144