



REMOVAL OF LINE MARKING

POLICY

REMOVAL OF LINE MARKING

April 2015
Version 1.0

Owner: Department of Transport

Manager: Transport Infrastructure Planning Division

OBJECTIVE

This policy details procedures that can be employed when removing line marking.

GUIDELINES

Unwanted markings must be removed, not “Blacked Out.” “Blacking Out” is only suitable as a temporary measure. Even long life “black out” materials will eventually wear out to reveal the original markings.

All line removal works must be carried out in such a manner as to not endanger the health, safety or amenity of employees, road users or the public in general. As per all operations carried out on roads, the safety of the worker and the public is first priority.

Removal of markings shall be carried out in such a manner as to minimise damage to pavement surfaces.

Whilst grinding is permitted in certain circumstances (refer Attachment 1), it must be carefully controlled to ensure that the pavement surface is not damaged or ground out. A combination of an initial grind, followed by some other removal process may be required to achieve the final result.

Markings shall be obliterated so as to not function as a recognisable marking.

The removed marking and the material used to remove the marking must be contained, collected and disposed of in an environmentally acceptable manner. Street sweeping can be coordinated with line removal.

No single method of line removal exists, that will work equally well on the wide variety of available marking materials used on varied pavement surfaces. Effective results can often be achieved through the utilisation of a combination of line removal methods. Attachment 1 provides guidance on the recommended methods.

When arrows, letters or figures (for example speed limit symbols) are to be removed (or temporarily “Blacked Out”), the removal pattern must be in the shape of a rectangle or square to minimise confusion to the motorist, particularly in wet weather and poor lighting conditions.

Thermoplastic line marking materials require special removal consideration. These materials may be many millimetres thick and will be difficult to remove by blasting techniques. It is recommended that advice be sought from line marking removal companies prior to ordering the work or incorporating into specifications.

When removing markings in or near built up areas the possible adverse effects of noise pollution should be considered when selecting a removal method.

Every removal method requires some operator skill and experience in order to ensure that the complete removal of the markings is achieved with minimal damage to the pavement surface.

DESIGN REQUIREMENTS

During the design process of upgrading existing roads, design officers must consider and specify the removal of unwanted line marking according to this policy.

Design officers must record by survey, photographs, and site inspections, existing line marking and specify in the tender documentation for the upgrade work:

- The scope of line marking removal, and itemise in the schedule.
- The method of removal.

It is insufficient to specify a generalised removal. Drawings must show the type of line marking to be removed, location, lengths, widths and removal treatments. Designers are referred to Attachment 1.

COMMON METHODS USED IN LINE MARKING REMOVAL

Blacking Out

“Blacking Out” is the phrase used to describe the practise of covering up unwanted markings with a topcoat of material similar in colour to the road surface. On bitumen roads, this usually involves the use of black paint to cover the markings no longer required, hence the term “Blacking Out”.

“Blacking Out” is generally prohibited as a permanent method for the removal of line marking. For economic reasons where large or lengthy sections of line marking have been identified or for rectification due to changes in policy or standards, approval in writing shall be obtained from the Executive Director Transport Infrastructure Planning Division.

Temporary methods of blacking out to cover up unwanted markings for a maximum period of one month are permitted. “Blacking Out” should only be used in situations where line removal equipment is not immediately available or in work zones where permanent markings are to be installed after the completion of roadwork.

“Blacking Out” may be warranted when timing is a critical factor to expedite traffic delineation changes.

Use of “Blacking Out” as a permanent solution to ‘remove’ unwanted lines has resulted in some of the following problems which have the proven potential to confuse motorists.

- The blacked out area can appear to have a different colour and gloss rating than the pavement surface, particularly under different lighting and weather conditions.
- On wet nights, blacked out lines may be reflected by vehicle headlights and cause motorists travelling in the opposing direction to “perceive” the blacked out lines as legitimate markings.
- The blacked out area can change in both colour and gloss as traffic erodes the coating, this has been known to cause problems, especially when sunlight reflects upon the blacked out markings at sunrise and sunset.
- The blacked out area will eventually wear away to reveal the original unwanted markings.
- Worn, blacked out surfaces may exhibit a different skid resistance to the rest of the pavement surface; this may lead to skidding problems especially in wet weather conditions.
- Upon wearing down of the blacked out area, the glass beads on the original line marking will protrude through and reflect light, giving the appearance of true line marking.

Grinding

Mechanical grinding is used to remove various types of marking materials from asphalt and concrete surfaces. However, it is not a recommended method to remove line marking from sprayed seals or high texture asphalt.

Grinding is achieved by the motorised, high speed rotation of hardened steel or tungsten carbide cutters. Pressure on the cutter head and the depth of grinding can be adjusted during the work to achieve satisfactory results.

Grinding is one of the most cost effective methods of removing pavement markings. Grinding does not, however, always leave the pavement surface undamaged, ‘Ghost lines’ a term used to describe the appearance of a line that is not actually there often result as a consequence of a rough surface profile created by the grinding process. However, when used in conjunction with the subsequent application of bituminous compounds for “blacking

out” the residue shadow of marking left in the pores by shallow grinding, this effect is minimised.

A push-along grinder is a comparatively inexpensive item of equipment that can effectively be operated by a single operator. Some of these smaller grinding units have the option to include a dust collection system, thus providing a dust free working environment.

More elaborate versions of self-propelled and ride-on grinders complete with dust collection systems are more suitable where many kilometres or large area of markings are to be removed.

Grinding usually produces an indentation in the pavement that is visually apparent and may hold rainwater, which can cause skidding. At night, the indentations may be visible and the old line marking may be mistaken for the current markings.

Blasting

Blasting is one of the most widely used techniques in line marking removal. The blasting media is accelerated and propelled at great speed and tremendous force and as it strikes the surface, markings are broken loose or removed by abrasion.

Blasting is by nature a noisy operation, and may prove to be an unacceptable option at certain locations or times of the day, especially in built up areas at night.

The removed markings and blasting materials should be contained, collected and disposed of in accordance with legislated environmental guidelines.

Occasionally, for expediency and in order to speed up the effectiveness of the blasting process, the top surface of the unwanted markings can be broken by physical means (e.g. by bolster, chisel and the like), followed by blasting.

Garnet Blasting

Garnet is a totally natural product, chemically inert and free of any toxic metals or crystalline silica. Blast cleaning with garnet means significantly lower dust emissions because of the incoherent toughness of the material and rapid setting due to its high specific gravity and therefore generating less dust to pavement users and operators. Water may be introduced to minimise dust and a street sweep of the area should be coordinated into the line removal, so that waste material is picked up before it can be transported by rain, wind and traffic.

High Pressure Water Blasting

High Pressure Water Blasting uses water pressurized by an extremely powerful motor to clean and remove markings from the pavement surface. These powerful motors can deliver pressure at the cleaning head of up to 138,000 kpa. The sheer force of the water delivered literally 'knocks' the markings off the pavement.

High Pressure Water Blasting units are usually large and use high volumes of water. They generally require three well-trained persons to operate and are therefore more suited for the removal of markings covering larger areas. Smaller portable units are also commercially available for use on small areas or in conjunction with other methods described in this policy.

Modern high pressure water blasting units are equipped with suction recovery around the pressure jet. This equipment has the capacity to recover 70% of removed paint particles. The remainder of loose paint particles can be recovered by the unit's suction only capacity or by section road sweeper.

For high pressure water blasting units without suction recovery mechanisms, it is recommended that a skirt is used around the blaster to minimise the spraying of material away from the work site and traps to prevent dislodged marking materials from entering into the storm water drainage system. Markings removed by this process are either swept or vacuumed up at the end of the operation, coordinate a street sweep to pick up waste material and dispose of in accordance with environmental guidelines.

In the hands of skilled operators, this process is claimed to be capable of removing all kinds of road marking products without damaging the road surface.

Resealing

Completely re-sealing the road is used when the line marking to be removed is on chip seal. By using a smaller chip (usually 7mm) it is possible to cover the old line markings. This technique is not encouraged on asphalt due to the texture of the surface. Asphalt is smoother and it is generally more effective to use other means. It is important to remember when using this technique that it is not permanent, as it is only covering the old line markings the seal will eventually wear down to reveal the old markings.

NOT RECOMMENDED

The following methods are **NOT RECOMMENDED** for the removal of line marking from sprayed seals or asphalt in the Northern Territory.

- Heat Lances
- Copper Slag
- Steel Shot
- Sand Blasting
- Water Blaster – Sodium Bicarbonate System, and
- Chemical Paint Removers

Any other methods of line marking removal that are not listed in this policy are to be referred to the Department for approval.

ATTACHMENT 1:

RECOMMENDED METHODS OF LINEMARKING REMOVAL FOR VARIOUS MATERIALS AND PAVEMENT SURFACES

Method Legend:

1. Blacking Out (not a true removal method, recommended as a temporary measure only)
2. Garnet Blasting
3. High Pressure Water Blasting
4. Grinding

TYPE OF MARKING MATERIAL TO BE REMOVED	RECOMMENDED METHODS OF REMOVAL
Water-borne Paint	2, 3, 4
Thermoplastic material	2, 4 (to remove the bulk of the marking down to surface level followed by 2 or 3)

TYPE OF PAVEMENT SURFACE OF REMOVAL	RECOMMENDED METHODS
Sprayed Seals	2, 3
Concrete	2, 3, 4
Asphaltic Concrete - Micro asphalt	2, 3, 4
Asphaltic Concrete – open graded	2, 3
Pavers	2, 3
Slurry Seals	2, 3, 4