Professional Services
Specifications (PSS)

Last updated:
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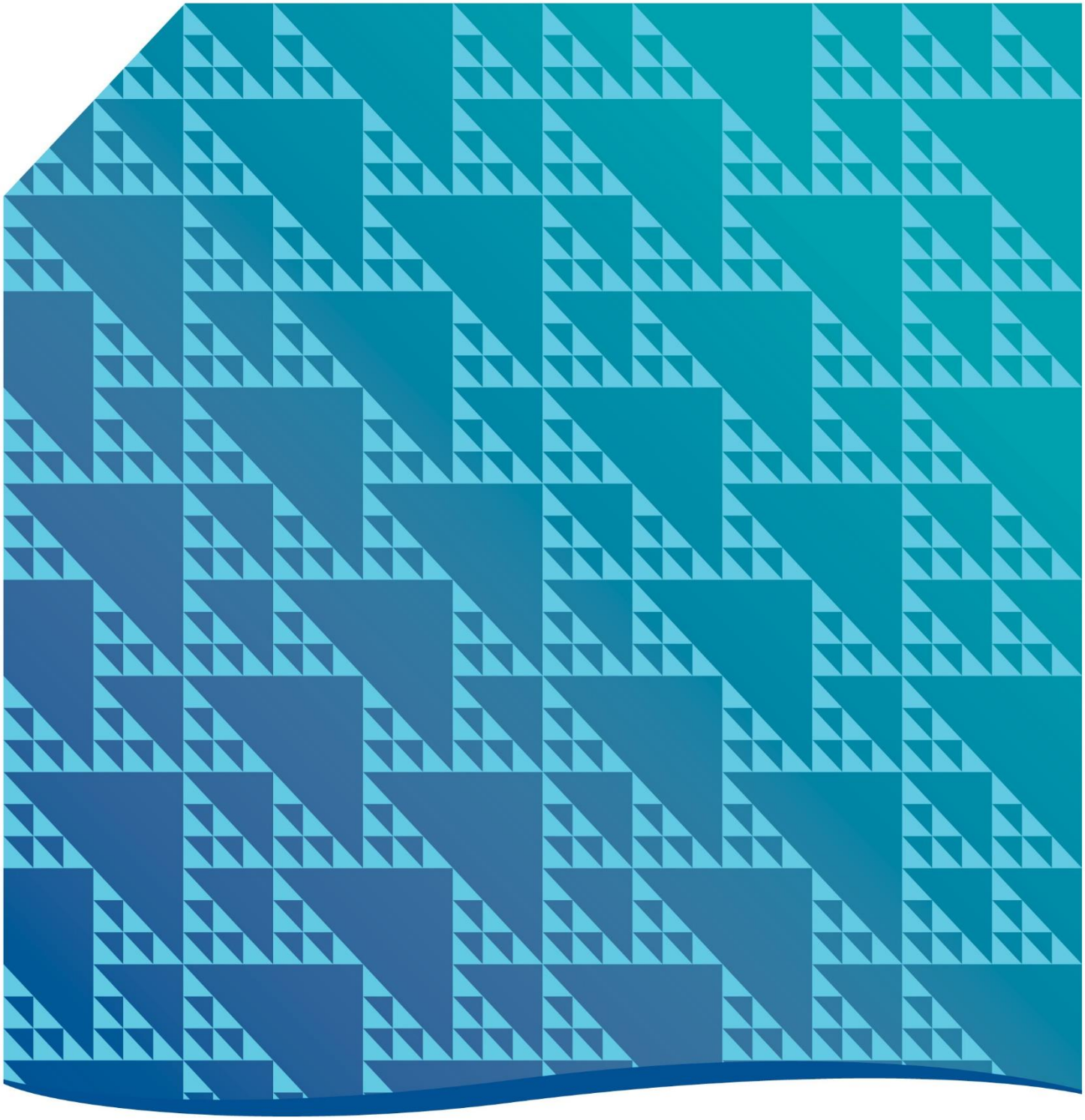
T10 – Traffic Signs & Pavement Marking



Department of State Growth

Tasmanian Government

Contents

Revision History

Version No.	Date	Description of changes
1.1	17 Aug 2020	Template updated and old references to superseded documents/entities updated

T10.1 Scope

This Professional Services Specification (PSS) sets out requirements for signing and pavement marking on State roads.

T10.2 Design Standards

Signing and pavement marking shall be in accordance with Australian Standard AS1742: Manual of Uniform Traffic Control Devices.

Regulatory and warning signs, other than speed limit signs, shall be:

- Size A in speed zones of 60 km/h or less and repeater speed limit signs;
- Size B in speed zones between 50 km/h and 100 km/h;
- Size C in speed zones of greater than100 km/h.

T10.3 Specific Requirements

Pavement marking shall be provided to meet the requirements of the below table. Pavement marking shall be provided to meet the requirements of Tables T10.3.1 and T10.3.2.

Level 1 material shall be installed for intersection markings in urban areas on asphalt surfacing.

RRPM's will not normally be installed where street lighting exists.

No audible edgelines shall be installed within 200 metres of residences.

Appendix T10.A details DSG's linemarking policy and provides guidance for product selection.

T10.3.1 Pavement Marking Requirements

Road Cross Section	**Material**	**Edgeline to be provided**		**RRPM#**	
		Non-audible	**Audible***	**centreline**	**edgeline**
A1	Level 1, 2 or 3	Yes	Yes	Yes	Yes
B1	Level 1, 2 or 3	Yes	Yes	Yes	Yes
C1	Level 2 or 3	Yes	No	Yes	Yes
D1	Level 2 or 3	Yes	No	Yes	Yes
D2	Level 2 or 3	Yes	No	Yes	No
E1	Level 2 or 3	Yes	No	Yes	No
F1 + F2	None	None	None	None	None

*Audible to be specified where crash history indicates it is required for safety as agreed with the Principal's Representative.

RRPMs should not be installed in areas where adequate street lighting is present.

T10.3.2 Pavement Marking Performance

Level	**Material to last**
1 Durable	More than five years
2 Standard	More than two years
3 Temporary	Up to two years

T10.A – Recommended Practice for Installation and Maintenance of Pavement Markings on State Roads

T10.A.1 Introduction

Many of the crashes reported on the State road network are single vehicle accidents on rural roads where the driver has lost control and left the carriageway. Road markings provide guidance to drivers that help them stay on the road. It is considered that enhanced delineation could be effective at reducing the number and severity of crashes. Obviously, such a change would have financial implications and would need to be supported with additional funding.

This document sets out a revised policy for pavement markings on State roads – what should be provided on which roads. It also discusses practice – what type of materials should be used and how frequently they should be maintained.

T10.A.2 Policy

Road markings are to be provided in accordance with:

- Technical Advice Sheet No.7 – Centre of the road markings; and
- AS1742, Part 2 – Traffic control devices for general use.

Roads with a width of 5.5 metres or greater should be provided with:

- centre of the road markings.

T10.A.2.1 MINIMUM LANE WIDTHS: 2.75 METRES

It has been estimated that 88% of the State road network is 5.5 metres or wider.

Roads with a width of 6.5 metres or greater should be provided with:

- centre of the road markings;
- RRPMs on the centreline; and
- edgeline markings with at least 0.1 metres outside the edgeline.

T10.A.2.2 MINIMUM LANE WIDTHS: 3.0 METRES

It has been estimated that 49% of the State road network is 6.5 metres or wider.

It is noted that RRPMs on roads that are snow-ploughed need to be designed accordingly.

The need for RRPMs is reduced where there is street lighting and the need for edgeline is reduced when there is kerbing.

The Category 1 and 2 Highways and dual carriageways with no street lighting should be provided with:

- centre of the road markings;
- RRPMs on the centreline;
- edgeline markings; and

- RRPMs outside the edgeline.

The need for audible markings will be identified on a site-by-site basis based on crash history. Audible markings are considered a countermeasure where inattention and falling asleep are leading to crashes.

T10.A.3 Product Selection

There are four marking materials available: water-based paint, extruded thermoplastic, sprayed thermoplastic, splatter thermoplastic, cold applied plastic and solvent-based paint.

- **Water based** paint is now specified in three application types
    - **Temporary**. A 200-micron film using standard beads that should last about a year. Initial retro-reflectivity should exceed 150 mcd/lux/m^2 with a residual at replacement of 100 mcd/lux/m^2. This has been our standard marking.
    - **Standard**. A 300-micron film using larger beads that should last 2 to 3 years. Initial retro-reflectivity should exceed 200 mcd/lux/m^2 with a residual at replacement of 100 mcd/lux/m^2.
    - **Durable** A 300-micron film using a durable resin and larger beads which should last 4 to 6 years. Initial retro-reflectivity should exceed 300 mcd/lux/m^2 with a residual at replacement of 120. This may replace thermoplastic for longitudinal marking on high use roads. It is also suitable as an initial marking on reseal sites.
- **Extruded thermoplastic** is a high cost product and some recent experiences with application have been less that satisfactory. It is suited to longitudinal marking where high durability is required. Thermoplastic is best suited for audible tactile markings on high traffic volume roads, intersections and for transverse markings. Initial retro-reflectivity should exceed 200 mcd/lux/m^2 with a residual at rejuvenation or replacement of 80.
- **Splatter thermoplastic** is a fairly recent innovation that has not been trialled in Tasmania. It may find use in urban lane line marking as it reputedly performs well in wet conditions.
- **Spray thermoplastic** is a fairly recent innovation but Field Operations staff report that trials of its use in Tasmania have been unsuccessful and there are no plans to continue its use.
- **Cold Applied Plastic** has been trialled interstate and is an effective long life (7 to 10 year) product. A methyl methacrylate product that provides a flexible film with good durability and excellent skid resistance when bauxite aggregate is added. A wide range of colours is available. Best used for chevrons, school on road marking, arrows, intersection thresholds, coloured cycle lanes and on road numerals or symbols. Excellent for areas where skid resistance is imperative. May need washing to maintain colours from time to time.
- **Solvent-based** paint has been found to have poorer performance than water based paint and there are also environmental issues associated with its use. It is no longer used unless temporary markings are required in poor weather conditions. Other temporary measures may be more appropriate than solvent-based paint.

T10.A.4 Remarking Management

Under the Southern Maintenance contract the specification calls for the markings to be maintained when they are 'worn' or 'ineffective'. These terms are subjective and difficult to enforce. The retro-reflectivity of markings can be measured with an instrument and future contract specifications will be based on such measurements. However, there is also the issue of what proportion of the markings have to be defective before a whole section is replaced.

Under the northeast and northwest contracts the Department identifies which roads it wants remarked each year. Roads are marked with water-based paint and have been renewed either annually or every two years.

In future it should be more cost effective to run period contracts for linemarking independent of the Maintenance Contract, as is done for the urban line marking. The remarking frequency should be determined by the performance of the marking. If retro-reflectivity is measured for the new line, as required by the specification, its life can be predicted and that prediction can be verified, or modified, by periodic performance measurements. The aim is to retain retro-reflectivity above 100 mcd/lux/m^2 that is considered to be an effective line performance measure.

T10.A.5 Road Marking Policy summary table

The following standard longitudinal lines shall be applied to State roads:

Sealed Road Width	**Type of Marking**	**Road Cross Section**
Roads with a width of 5.5 metres or greater	Centre of the road markings	E1
Roads with a width of 6.5 metres or greater	Centre of the road markings; RRPMs on the centreline; and Edgeline markings	D1, D2
Category 1 or 2 and dual carriageway highways with no street lighting	Centre of the road markings; RRPMs on the centreline; Edgeline markings; and RRPMs outside the edgeline.	A1, B1, C1

T10.A.6 Road Marking Guidelines

T10.A.6.1 Material Selection

Type of Markings	**Situation**
Temporary	Pavements due for reseal or remarking within 2 years
Temporary	Local repairs following patching
Standard	Routine markings for Category 3, 4 & 5 roads
Standard	Urban intersection marking for traffic <5,000 vpd
Durable	Alternative markings for Category 1 & 2 highways
Durable	Marking of reseal sites where longer life is desired.
Extruded Thermoplastic	Audible tactile edge or centre lines

Extruded Thermoplastic	Routine markings for Category 1 & 2 highways
Extruded Thermoplastic	urban longitudinal lane lines in traffic >5,000 vpd
Extruded Thermoplastic	urban transverse lines in traffic >5,000 vpd
Cold Applied Plastic	urban road markings needing long life and skid resistance
Cold Applied Plastic	Coloured lanes or on road patches symbols or numerals

T10.A.6.2 Line Remarking Frequency

Type of Markings	**Initial retro-reflectivity**	**Frequency** (months)
Temporary	120 mcd/lux/m^2	12
Temporary	200 mcd/lux/m2	24
Standard	150 mcd/lux/m^2	24
Standard	250 mcd/lux/m^2	36
Standard	>300 mcd/lux/m^2	42
Durable	250 mcd/lux/m^2	48
Durable	300 mcd/lux/m^2	60
Durable	>350 mcd/lux/m^2	72
Thermoplastic – audio	200 mcd/lux/m^2	60
Thermoplastic urban long	200 mcd/lux/m^2	48
Thermoplastic urban transverse	200 mcd/lux/m^2	36
Cold Applied Plastic	200 mcd/lux/m^2	72 +

Audible tactile thermoplastic may be refreshed with a temporary line over the top provided the line is still functional as an audible tactile warning.

Wear rates and reduction in retro-reflectivity are affected by lane widths, alignment of the road, weather, percentage of trucks, and sand application to icy roads.

However the above values are indicative of the expected life.

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