Guidelines For The Use Of Coloured Pavement Surface Treatments and Markings In Brisbane City Council

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Revision 2.1: November 2008
Document Control Information

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<th>Date</th>
<th>Version Number</th>
<th>Description</th>
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<td>24/01/2006</td>
<td>--</td>
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<td>Dallas Lee</td>
<td>18/04/2006</td>
<td>V0.2</td>
<td>Draft for comment</td>
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<td>13/06/2006</td>
<td>V1.0</td>
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</tr>
<tr>
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<td>22/11/2006</td>
<td>V1.1</td>
<td>Revised draft – updated standard drawing references</td>
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<tr>
<td>Dallas Lee</td>
<td>05/08</td>
<td>V2.0</td>
<td>Document finalised – fully revised and updated. Approved by stakeholders</td>
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<td>11/08</td>
<td>V2.1</td>
<td>Intervention criteria added and general updated completed.</td>
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Important

This document will be subjected to continual revision over time. It is important that if reference is made to a printed copy of this document, it may have been superseded and thus inaccurate.
# Amendment Register

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<td>April 2006</td>
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<td>June 2006</td>
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<td>3</td>
<td>Revised draft – updated standard drawing references</td>
<td>November 2006</td>
</tr>
<tr>
<td>V2.0</td>
<td>All</td>
<td>Final revision for formal issue and adoption. All sections reviewed and modified. Appendix B and Appendix D added to document</td>
<td>January 2008</td>
</tr>
<tr>
<td>V2.1</td>
<td></td>
<td>Document Control Information – Signed Authorisation added</td>
<td>November 2008</td>
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<td></td>
<td>6</td>
<td>Reference updated</td>
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<td>9</td>
<td>New Reference included</td>
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<td>10</td>
<td>Section renamed to 'High Friction Surface Treatments'. Section reviewed and replacement requirements clarified</td>
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<td>11</td>
<td>Section 11.1 reviewed and additional requirements added, Section 11.2 Intervention Criteria added to document. Section 11.3 renumbered.</td>
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<td>12.1</td>
<td>Treatment type definitions clarified and aggregate material note added.</td>
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<td>15</td>
<td>Appendix C image updated with later version.</td>
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1 Introduction

The increased use of coloured or decorative pavement surface treatments and markings has increased dramatically in Brisbane in the past 15 years. These are typically used to alert road users to a different or modified driving environment or the presence of other traffic control measures requiring extra caution.

These treatments and markings are normally a screeded or sprayed surface treatment applied over the existing road surface, stencilled/patterned and/or coloured concrete or pavers/bricks.

There are many uses for these treatments or markings, including:

- Entry thresholds on areas with Local Area Traffic Management Schemes (traffic calmed area);
- Guidance/delineation through traffic calming devices within areas with Local Area Traffic Management Schemes;
- Bicycle lanes;
- Bus and Transit lanes;
- Contrasting/highlighting other pavement markings – e.g. speed limit legends and pedestrian crossings
- High ‘anti-skid’ treatments (not a coloured treatment, but often appears very similar)

While many of these treatments and markings perform a necessary traffic function, some (especially those in newer subdivisions) have been installed as an aesthetic enhancement to the streetscape. With many of these treatments, or the road surface under or around them, now reaching the end of their useful life, the question has been asked whether they should be replaced and how the Council is to replace or rehabilitate them.

This guideline does not cover treatments or decorative finishes applied to traffic islands and medians. These are considered a non-trafficked areas and fall outside the materials and processes described in this guideline.

NOTE: This document is intended a general guideline only. If there is any doubt as to the validity or relevance of a marking, advice should be sought from Road Use Management section of Transport & Traffic for a detailed response.

2 Acronyms

BCC  Brisbane City Council
BCW  Brisbane City Works
BID  Brisbane Infrastructure Division
CA  City Assets Branch (of Brisbane Infrastructure Division)
LATM  Local Area Traffic Management
MUTCD  (Queensland) Manual of Uniform Traffic Control Devices
QDMR  Queensland Department of Main Roads
SAM  Strategic Asset Management (section of CA)
SCIP  Suburban Centre Improvement Program
T&T  Transport and Traffic Branch (of Brisbane Infrastructure Division)
WB  Waterborne (Paint)

3 References

Queensland Manual of Uniform Traffic Control Devices
- Part 09 – Bicycle Facilities
- Part 10 – Pedestrian Control and Protection
- Part 12 – Bus, Transit and Truck Lanes
- Part 13 – Local Area Traffic Management
4 General Pavement Marking

All general longitudinal and transverse pavement markings are to be completed to the relevant BCC Standard Drawings. Where a BCC Standard Drawing does not fulfil the requirement, markings are to comply with the MUTCD.

The following is a list of relevant BCC Standard Drawings for general pavement marking:

- UMS 840: Pavement Markings, Longitudinal Lines;
- UMS 841: Pavement Markings, Transverse Lines;
- UMS 846: Pavement Markings, Pavement Arrows and Give Way Symbol;
- UMS 847: Pavement Markings, Merge Arrows;
- UMS 848: Pavement Markings, Pedestrian, Rail & Bike Crossings and Transit Lanes;
- UMS 849: Pavement Markings, Bus Lane Details;
- UMS 851: Bikeway Pavement Markings.

5 Local Area Traffic Management (LATM) Schemes (Traffic Calming)

The correct usage of threshold treatments is to designate a changed road environment where arterial or sub-arterial roads (typically 60km/h or greater) intersect neighbourhood or local access roads (50km/h or less). The intent is to highlight a change of speed limit or road function i.e. movement vs. access. The treatment for the entrance to an LATM consists of a threshold treatment (typically full width of road) of red with a yellow border.

Coloured pavement treatments are also used to delineate the path through a traffic management/calming device. These treatments are the same as used for a threshold treatment, namely red with a yellow border.

Some developments often have threshold treatments where they do not have a traffic management function, i.e. local access road to local access road. These treatments are not to be replaced or reinstalled.

The relevant BCC Standard Drawings for coloured surface treatments within LATM schemes are listed below:

- UMS 901: (Road Network Guidelines) General Design Criteria Local Traffic Areas In Brisbane City;
- UMS 902: (Road Network Guidelines) Coloured Pavement Threshold Treatment General Design And Specification;
- UMS 912: (Road Network Guidelines) Roundabouts Within Local Traffic Area Fully Mountable AC Plateau;
- UMS 923: (Road Network Guidelines) Pedestrian Refuge Provision At Zebra Crossing;
- UMS 941: (Road Network Guidelines) Speed Platform – Mid Block General Design Criteria;
- UMS 942: (Road Network Guidelines) Speed Platform – Intersection General Design Criteria;
- UMS 971: (Road Network Guidelines) Gateway To Local Traffic Area General Design Criteria.
6  **Bus Lanes and Transit Lanes**

There are special requirements for the installation of bus and transit lanes which use/require a coloured pavement surface marking and normal longitudinal markings.

For the installation of bus lanes, refer to Queensland Department of Main Roads drawings TC1427 (pages 1 and 2) or Road Use Management of T&T for guidance.

The relevant drawings for coloured Transit Lane Markings and Bus Lane Markings are listed below:

- TC1244: Pavement Marking Symbol – Transit Lane T2/T3;
- TC1427 (Sheet 1 of 3 and Sheet 2 of 3) – Bus Lane Marking.

7  **Bicycle Lanes**

Coloured bicycle lanes are typically used to delineate specialist bicycle facilities and lanes on the road pavement. They serve to restrict access where there are high levels of interaction between bicycles and other road users, typically at intersections. Coloured bicycle lanes are green in colour.

Associated longitudinal and transverse pavement marking types and dimensions are shown in the MUTCD and BCC Standard Drawings.

For typical longitudinal traffic markings, waterborne paint is preferred for these applications if the thickness tolerance for longlife material cannot be achieved.

A longlife material (other than hot applied thermoplastic) maybe used on high volume roads where excessive wear may occur. Any markings in a longlife material are not to exceed 3mm in thickness. The use of hot applied thermoplastic markings is to be avoided in areas with high bicycle use, particularly when used for bicycle lanes.

Testing has shown that hot applied thermoplastic can be hazardous to bicycles (and motorcycles) due to the potential for water build-up or ponding behind the line which has the potential to contribute to aquaplaning and the potential for low skid-resistance on the surface of the material if an anti-skid material is not applied at installation.

Refer to BCC Reference Specification S150-Roadworks for material details.

Refer to Active Transit of T&T for guidance and for details on bicycle lanes.

The relevant BCC Standard Drawings for coloured surface treatments for bicycle lanes are listed below:

- UMS 876: Bike Lanes At Signalised Intersection, Through & Right Turn Movement;
- UMS 877: Bike Lanes At Signalised Intersection, Left Turn Slip Lane;

8  **School Zone Enhancements**

School Zone Enhancements (SEZ) markings are installed to alert motorist that they are entering a specialist traffic zone. The SEZ consists of a threshold treatment (either part or full width of road) of red with a yellow border with the legend ‘SCHOOL ZONE’ written in white across the red section of the threshold. They are installed according to the criteria listed below.

8.1  **School Zone Enhancement Installation Criteria**

School Zone Enhancements (Thresholds) markings are only to be installed on roads with the following characteristics:

- on roads with a general speed limit of 60km/h;
- on roads where traffic volumes are greater than 6000 vehicles per day;
- on roads where traffic volumes are greater than 1250 vehicles between 7-9am;
- on roads where traffic volumes are greater than 900 vehicles between 2-4pm; and
- near schools with enrolments greater than 600 students.

Studies have shown that School Zone Enhancements (Thresholds) markings are generally not very effective in reducing vehicular speeds before and after school times where daily traffic volumes were less than 300 and had a general speed limit of 50km/h. Some school zone thresholds have been shown to have an effect in reducing vehicular speeds outside normal School Zone times. While School Zone Enhancements do not reduce vehicular speeds at all locations, it has been
shown that the change in road environment does raise driver awareness, particularly on those roads with moderate traffic volumes.

These criteria were developed after an evaluation of Council’s School Zone Enhancements (Thresholds) markings was conducted, and data collected at five sites (four treatments and one control) before and after installation of the marking.

The relevant BCC Standard Drawing for coloured pavement surface markings for a School Zone Enhancement Treatment is listed below:

- UMS 993: (Road Network Guidelines) School Zone Enhancement Treatment Pavement Marking.

9 Pedestrian Facilities

A coloured pavement surface marking maybe used at pedestrian facilities to show a clear path or delineation for users. These facilities include pedestrian refuges and pedestrian build-outs at crossings.

Coloured pavement markings may also be installed to highlight or provide a contrast for pedestrian facilities, for example, a Zebra Crossing.

The relevant BCC Standard Drawing for coloured pavement surface markings for a pedestrian crossing is listed below:

- UMS 923: (Road Network Guidelines) Pedestrian Refuge, Provision at a Zebra Crossing;
- UMS 993: (Road Network Guidelines) School Crossing, With Pedestrian Refuge.

10 High Friction Surface Treatments

This treatment is applied to areas or sections of a road that has a history of accidents and/or considered to have a surface with an unacceptable skid level.

While not technically a coloured pavement treatment and not performing a traffic function, these treatments are normally a different colour to the existing road surface and are often very noticeable. They are covered by the same specification as coloured pavement treatments and are often applied by the same suppliers using very similar techniques.

Care has to be taken when considering work on or near these treatments as their installation is considered a safety issue. When maintenance is required on these treatments, they must be replaced with a high fiction surface treatment that has a minimum skid resistance value of 65 BPN. This material is to comply with BCC Reference Specification S150 – Roadworks.

For new installations, refer Road Use Management section of T&T for guidance.

Refer to BCC Reference Specification S150 – Roadworks for material requirements.

11 Installation and Re-instatement – Coloured Pavement Treatments and Markings

11.1 General Requirements

Coloured pavement surface treatments are only to be installed or re-instated where they serve a traffic management function or as described in this document. Examples include where they are part of a LATM or Traffic Calming Scheme, bus or bicycle lanes, a school zone or pedestrian facilities.

Threshold treatments need to be maintained where local and neighbourhood roads meet arterial, sub-arterial or district access roads as defined in the Road Hierarchy Plan for Brisbane. Treatments will also need maintenance where they delineate the path through a traffic control device or on a speed platform within a controlled area due to wear or following pavement resurfacing.

Always replace or rehabilitate markings with the current Council Standard or requirements. DO NOT simply replace old markings with what is currently installed – ensure the current and correct marking is applied. Older treatments, especially in LATM areas, will often have a pattern (river stone) finish – this method is no longer used with all treatments being installed in a solid colour. An example is the replacement of an existing LATM threshold; use only the colours (without pattern) as described in the standards and specification (i.e. red with yellow border).
Threshold treatments at local intersections that are clearly defined T-junctions should not require maintenance.

In cases where the threshold is at a T-junction that is not clearly defined, the threshold should be maintained as an indication of intersection priority, that is the threshold is on the terminating road. If there is any doubt, advice should be sought from Road Network officers (T&T) for the area. Alternatively the treatment could be replaced with an appropriate intersection treatment such as the installation of signage and standard pavement marking (for example, a Give Way line).

Where a treatment or marking does not meet or justify the above requirements and is not to be maintained or replaced, the following is to occur:

- Where the treatment or marking is critical and is likely cause user reaction, or influence user response, the marking is to be removed as soon as practicable by either:
  - Grinding or abrasive (sand or water) blasting of the material from the pavement surface;
  - Cold planning of marking area and resurfacing with thin re-sheet of asphalt;

- Where the treatment or marking is not critical and is unlikely to cause user reaction or concern, the marking is to be left to wear normally and/or be replaced by the next scheduled resurfacing of the pavement.

If necessary, the community will need to be advised where the treatment or marking is not being replaced.

### 11.2 Intervention Criteria

Once a treatment or marking has been assessed to meet the general requirements for replacement or re-instatement, the following intervention criteria is to be applied to determine condition and work priority.

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<td>A</td>
<td>Ok. No work required.</td>
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<tr>
<td>≥25%, &lt;50%</td>
<td>B</td>
<td>Monitor and add to forward planning/schedule list (long list)</td>
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<tr>
<td>≥50%</td>
<td>C</td>
<td>Replace ASAP (i.e. when priorities/resources permit), if not possible immediately, placed on next schedule list.</td>
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Where the treatment or markings form part of an area wide scheme, consideration should be given to treating all the treatments or markings within that area or scheme, or at minimum, all like treatments or markings within the area or scheme. This could include:

- All the treatment or markings within an LATM scheme, including thresholds and devices;
- Only the threshold treatments on the boundary of an LATM scheme;
- All the School Zone Enhancement markings around a school;
- All the Bicycle Lane markings at an intersection.

By adopting this approach, it retains a consistent level of service for all the markings and provides a consistent message for users.

Isolated or single treatment or markings are to be replaced or re-instated as need requires.

### 11.3 Other Surface Materials

Where treatment or marking is completed in a material other than a surface applied material (pavers or concrete), and rehabilitation or replacement is justified, remove existing material and replace with asphalt surface and surface applied coloured treatment or marking. Where road surface requires rehabilitation and replacement of colour surface is not justified, remove and replace with asphalt surface.

If necessary, the community will need to be advised where the treatment or marking is not being replaced.

An exemption to this requirement is those areas located within the CBD and SCIP’s that have special requirements under the Centres Detail Design Manual.
12 Specifications

12.1 Specifications for Coloured Pavement Surface Treatments

These coloured pavement surface treatments are covered in Section 7 of the BCC Reference Specification S150-Roadworks. Coloured surface treatments are broken into two types as described below:

Type 1: Coating systems generally for traffic delineation and guidance, typically in a light traffic environment (e.g. Threshold treatments in residential areas or bicycle and bus lanes);

Type 2: Specialised (resin) bonded aggregate systems for locations where a high skid resistance surfacing is required. (Locations of wet weather skidding, accident black spots).

A supply panel has been appointed for the supply and installation of coloured pavement surface treatments to BCC – contact BCW Signs and Lines for supplier details.

Note: Aggregates used in coloured treatments are to be clean, dry, hard, tough, durable, moderately sharp grains of either natural stone or calcined bauxite.

Other aggregate materials (e.g. crushed glass) are not included in the material specification for use by Council and are not to be used on Council controlled roads or infrastructure.

12.2 Specifications for General Pavement Markings

The materials and applications requirements for general pavement markings are covered in Section 9 of the BCC Reference Specification for Civil Engineering Works S150-Roadworks. This specification details the acceptable materials and defines the requirements for the installation of longitudinal and transverse pavement markings including glass beads and anti-skid material.