SNOWY RIVER SHIRE COUNCIL

DEVELOPMENT CONSTRUCTION SPECIFICATION

C261

PAVEMENT MARKINGS

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
EXAMPLE 1	*Provision for acceptance of nonconformance with deduction in Payment*	*XYZ.00*	*AP*	*KP*	*2/6/97*

SPECIFICATION C261 : PAVEMENT MARKINGS

GENERAL

C261.01 SCOPE

1. The work to be executed under this Specification consists of the setting out, supply and application of pavement marking paint, thermoplastic pavement marking material, pavement marking tape and raised pavement markers as shown on the Drawings and in accordance with this Specification.

2. Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited in the Specification Part for Quality Requirements. ***Quality***

3. This specification shall not override any applicable State or Local Government legislation AND shall be read in conjunction with AS 1742.3 AND the Roads and Traffic Authority (NSW) RTA QA Specification R141 Pavement Marking (or equivalent document in other states). ***Conformance***

C261.02 REFERENCE DOCUMENTS

1. Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated. ***Documents Standards Test Methods***

(a) Council Specifications

C201	-	Control of Traffic

(b) Australian Standards

AS 1580.107.3	-	Determination of wet film thickness by gauge.
AS 1742.2	-	Traffic control devices for general use.
AS 1906.3	-	Raised pavement markers (retroreflective and non-retroreflective).
AS 2009	-	Glass beads for road-marking materials.
AS 4049.2	-	Thermoplastic road marking materials.
AS 4049.3	-	Waterborne paint - For use with drop-on beads
AS 1742.3	-	Manual of uniform traffic control devices - Traffic control devices for works on roads

(c) Other

Roads and Traffic Authority (NSW) - RTA QA Specification R141 Pavement Marking

C261.03 TYPE OF MARKINGS

1. Details of the various types of pavement markings and devices are generally in accordance with the requirements of AS 1742.2. ***Standard***

C261.04 TYPES OF MATERIALS TO BE APPLIED

1. The materials shall be applied as follows: ***Locations for Use***

   (a) Pavement Marking Paint

Permanent markings on all wearing surfaces. Temporary markings, other than on the final wearing surfaces. Traffic islands and kerbs where specified.

(b) Thermoplastic Pavement Marking Material

Permanent markings where explicitly indicated on the Drawings.

(c) Pavement Marking Tape

Temporary markings on final wearing surfaces.

(d) Reflective Glass Beads

To be applied to all painted and thermoplastic markings.

(e) Raised Pavement Markers

To be installed as permanent and temporary markings as shown on the Drawings.

(f) Cold Applied Plastics

To be installed in accordance with manufacturer's specification

Notice to Compiler

This specification does not cover Cold Applied Plastics (CAP) although their use throughout Australia is quite common as a long life product. For details of application and installation refer to the manufacturer's specifications.

C261.05 MATERIAL QUALITY

1. The Contractor shall submit to the Superintendent NATA Registered Laboratory Test Reports, at least seven days before work is scheduled to commence, on the quality of the materials, including paint, glass beads, raised pavement markers and thermoplastic material proposed for use. ***Contractor's Responsibility***

2. Only materials conforming to the requirements of the referenced Specifications/Standards shall be used. ***Quality Requirements***

C261.06 SETTING OUT

1. The Contractor shall set out the work to ensure that all markings are placed in accordance with the Drawings. ***Contractor's Responsibility***

2. The locations of pavement markings shall not vary by more than 20mm from the locations shown on the Drawings. ***Tolerance***

C261.07 SURFACE PREPARATION

1. Pavement markings shall only be applied to clean dry surfaces. The Contractor shall clean the surface to ensure a satisfactory bond between the markings and wearing surface of the pavement. ***Clean Dry Surface***

2. Pavement marking shall not be carried out during wet weather or, if in the opinion ***Wet Weather***

of the Superintendent, rain is likely to fall during the process (unless otherwise directed).

3. Where raised pavement markers are specified for pavements having a concrete wearing surface, the full area under each raised pavement marker shall be lightly scabbled to remove fine mortar material (laitance). ***Scabbling***

C261.08 PROVISION FOR TRAFFIC AND PROTECTION OF WORK

1. The Contractor shall provide for traffic, in accordance with the Specification for CONTROL OF TRAFFIC, while undertaking the work and shall protect the pavement markings until the material has hardened sufficiently so that traffic will not cause damage. ***Contractor's Responsibility***

C261.09 MAINTENANCE OF PAVEMENT MARKINGS

1. The Contractor shall be responsible for the maintenance, and replacement if necessary, of raised pavement markers and all pavement marking during the contract period and the contract defects liability period. ***Responsibility in Contract Period***

PAVEMENT MARKING PAINT

C261.10 MATERIALS

1. Paint shall comply with the requirements of AS 4049.3 and any State Road Authority specifications (where applicable) as directed by the Superintendent. In this Specification, the term 'paint' shall mean 'pavement marking paint'. ***Paint Quality***

2. Glass beads shall comply with the requirements of AS 2009. ***Glass Beads Quality***

Note: This Specification details the application of class B “drop-on beads” and class D “large wet weather beads” only. Other types of glass beads may be used (refer to Annexure C261B). In each case, beads shall be specified and installed in accordance with AS 2009.

Notice to Compiler ***Other materials***

The use of angular materials such as Quartz on transverse or longitudinal markings is not covered in this Specification. However, it is recognised as being widely used throughout Australia, in varying forms, to increase skid resistance in road markings. For details of their application and installation refer to the manufacturer’s instructions.

C261.11 MIXING OF PAINT

1. All paint shall be thoroughly mixed in its original container before use to produce a smooth uniform product consistent with the freshly manufactured product. ***Uniform Product***

C261.12 APPLICATION OF PAINT AND BEADS

1. All longitudinal lines shall be sprayed by an approved self propelled machine. The two sets of lines forming a one-way or two-way barrier line pattern shall be sprayed concurrently (unless otherwise directed by the superintendant).. ***Longitudinal Lines***

2. Hand spraying with the use of templates (where necessary) to control the pattern and shape shall be permitted for transverse lines, symbols, legends, arrows and chevrons. ***Hand Spraying***

3. The paint shall be applied uniformly and the dry film thickness shall be a minimum of 0.20mm for class B beads, or 0.30mm for class D beads ***Paint Thickness***

4. Class B glass beads shall be applied to the surface of all longitudinal lines at a ***Beads for***

min application rate of 0.50 kilograms per square metre immediately after the application of the paint. The actual application rate shall be set to overcome any loss of beads between the bead dispenser and the sprayed line. ***Longitudinal Lines***

5. Class B glass beads shall be similarly applied to all other paint markings at a min application rate of 0.30 kilograms per square metre immediately after application of the paint by a method approved by the Superintendent. Class D glass beads shall be similarly applied to all other markings at a min application rate off 0.5kg/m^2. ***Beads for other Markings***

6. Pavement markings shall be straight or with smooth, even curves where intended. All edges shall have a clean, sharp cut off. Any marking material applied beyond the defined edge of the marking shall be removed leaving a neat and smooth marking on the wearing surface of the pavement. ***Pavement Marking Finish***

7. The lengths of longitudinal lines shall conform to any applicable local or state requirements and not vary by more than +20mm -0mm from the lengths shown in AS 1742.2 The widths of longitudinal lines shall not vary by more than +10mm -0mm from the widths shown in AS 1742.2. ***Longitudinal Line Tolerances***

8. The lengths and widths of transverse lines shall not vary by more than 10mm from the lengths and widths shown in AS 1742.2. ***Transverse Line Tolerance***

9. The dimensions of arrows, chevrons, painted medians, painted left turn islands and speed markings shall conform to any applicable local or state requirements and shall not vary by more than 50mm from the dimensions shown on the Drawings or in AS 1742.2 as appropriate. Arrows and speed markings shall be placed square with the centreline of the traffic lane. ***Arrows, Chevrons Tolerance***

Notice to Compiler

Class D beads are not suited for use with solvent-based paints (AS 4049.1). Class D beads are suited for use with thermoplastic (AS 4049.2) and with waterborne paint (AS 4049.3). Class D beads intended for use with thermoplastic shall be supplied with a proprietary adhesive coating which shall be clearly labelled on the packaging.

C261.13 FIELD TESTING

1. The thickness of the wet film applied to the road pavement shall be checked by the method described in AS 1580.107.3 Method B, comb gauge. ***Paint Application***

2. The application rate of glass beads applied to the surface of the markings shall be checked by the method described in Annexure C261A. ***Beads Application***

Road Speed km/h	Line Widths				
	80mm	100mm	120mm	150mm	200mm
8	396	495	594	742	990
13	643	804	965	1207	1698
16	791	990	1188	1484	1484

1. Tolerance of +10% shall be permissible when measuring the above volume.
2. When two or more glass bead dispensers are to be used, each dispenser shall be checked separately to make up the totals shown.
3. Glass beads weigh approximately 1.53 grams per millilitre.

Table C261.1 - Volume of glass beads (ml) required in 10 seconds of operation

THERMOPLASTIC PAVEMENT MARKING MATERIAL

C261.14 MATERIALS

1. Thermoplastic pavement marking material shall comply with the requirements of AS 4049.2. ***Thermoplastic Quality***

2. In this Specification, the term 'thermoplastic material' shall mean 'thermoplastic pavement marking material'. ***Definition***

3. Glass beads shall be incorporated in thermoplastic material, in the proportion of a min 20% of the total mass, as part of the aggregate constituent and shall comply with the requirements of AS 2009, Intermix type class C beads with 20-30% by mass wet weather beads. ***Glass Bead Proportion***

4. Glass beads for surface application shall comply with the requirements of AS 2009, class B “Drop-on beads” or class D “wet weather beads”. ***Glass Bead Quality***

5. Tack coat material shall be to the manufacturer's specification as approved by the Superintendent. ***Tack Coat***

C261.15 PREPARATION OF THERMOPLASTIC MATERIAL ON SITE

1. Immediately before application, the thermoplastic material shall be uniformly heated in a suitable kettle to the temperature recommended by the manufacturer. The thermoplastic material shall not be heated above the temperature recommended by the manufacturer. The thermoplastic material shall not remain molten for more than six hours for hydrocarbon resins and four hours for wood and gum resins. Should over-heating occur and/or the time expire for molten materials, then the thermoplastic material shall be discarded. ***Heating***

C261.16 APPLICATION OF THERMOPLASTIC MATERIAL AND BEADS

1. Where the wearing surface of the pavement is smooth or polished, a tack coat of material may be required by the Superintendent and shall be applied in accordance with the recommendations of the thermoplastic manufacturer. The tack coat shall be applied immediately before the application of the thermoplastic material in accordance with the directions of the manufacturer of the thermoplastic material and the manufacturer of the tack coat material. ***Tack Coat Requirement***

2. All longitudinal lines shall be sprayed (or extruded in the case of profiled markings) by a self propelled machine approved by the Superintendent. The two sets of lines forming a one-way or two-way barrier line shall be sprayed concurrently. The thermoplastic material shall be applied uniformly and the cold film thickness shall be 3.0mm with a tolerance of plus or minus 0.5mm. ***Longitudinal Lines***

3. Class B glass beads shall be applied by air propulsion or gravity fed to the surface of all longitudinal lines at a net application rate of 0.30 kilograms per square metre immediately after application of the thermoplastic material. The actual application rate shall be set to overcome any loss of beads between the bead dispenser and the sprayed line. Class D glass beads shall be applied at a min rate of 0.5kg/m^2. ***Beads for Longitudinal Lines***

4. Where transverse lines, symbols, legends and arrows are to be screeded, the screeded thermoplastic material shall be applied using a mobile applicator, approved by the Superintendent, and templates to control the pattern. ***Screed***

5. The thermoplastic material for transverse lines, symbols, legends and arrows shall be applied uniformly and the cold film thickness shall be 3.5mm with a tolerance of ***Tolerance***

plus or minus 0.5mm. The surface finish shall be smooth.

6. Class B glass beads for other than longitudinal lines shall be uniformly applied to screeded markings at a min application rate of 0.30 kilograms per square metre immediately after application of the thermoplastic material by a method approved by the Superintendent. Class D glass beads shall be applied at a min application rate of 0.50kg/m^2.

Beads for Other Markings

7. Pavement marking shall be straight or with smooth, even curves where intended. All edges shall have a clean, sharp cut off. Any marking material applied beyond the defined edge of the marking shall be removed leaving a neat and smooth marking on the wearing surface of the pavement.

Pavement Marking Finish

8. The lengths of longitudinal lines shall not vary by more than 20mm from the lengths shown in AS 1742.2. The widths of longitudinal lines shall not vary by more than 10mm from the widths shown in AS 1742.2.

Longitudinal Line Tolerances

9. The lengths and widths of transverse lines shall not vary by more than 10mm from the lengths and widths shown in AS 1742.2.

Transverse Line Tolerances

10. The dimensions of arrows, chevrons, painted medians, painted left turn islands and speed markings shall conform to any applicable local or state requirements and not vary by more than 50mm from the dimensions shown on the Drawings or in AS 1742.2 as appropriate. Arrows and speed markings shall be placed square with the centreline of the traffic lane.

Arrows, Chevrons, Tolerance

Notice to Compiler

Glass beads of class D wet weather beads intended for use with thermoplastic applications shall be supplied with a proprietary adhesive coating, & shall be clearly labelled on the packaging**.**

C261.17 FIELD TESTING

1. The thickness of the cold film of thermoplastic material applied to the road pavement shall be checked by measurement, using a micrometer, of the thickness of thermoplastic material applied to a metal test plate.

Thickness of Thermoplastic Material

2. The application rate of glass beads applied to the surface of the markings shall be checked by the method described in Annexure C261A.

Glass Beads Application Rate

PAVEMENT MARKING TAPE

C261.18 MATERIALS

1. Pavement marking tape shall be a strippable type of tape approved by the Superintendent.

Brands

C261.19 APPLICATION OF PAVEMENT MARKING TAPE

1. The method of application of pavement marking tape, including surface preparation, shall be in accordance with the manufacturer's recommendations.

Manufacturer's Recommen-dation

C261.20 REMOVAL OF PAVEMENT MARKING TAPE

1. When directed by the Superintendent, the Contractor shall remove pavement marking tape in accordance with the manufacturer's recommendations. ***Manufacturer's Recommendation***

RAISED PAVEMENT MARKERS

C261.21 MATERIALS

1. Raised pavement markers, both reflective and non-reflective, shall comply with AS 1906.3 and shall have the dimensions shown on the Drawings. ***Standard***

2. The adhesive used for attaching the raised pavement markers to the wearing surface of the pavement shall be a hot melt bitumen adhesive or an equivalent product approved by the Superintendent. ***Bitumen Adhesive***

C261.22 INSTALLATION OF RAISED PAVEMENT MARKERS

1. Raised pavement markers shall be fixed to the wearing surface of the pavement using a hot melt bitumen adhesive or an equivalent product. The adhesive shall be freshly heated to the Manufacturer's instructions and thoroughly mixed. The adhesive shall not be allowed to cool and be reheated prior to use. ***Adhesive Quality***

2. The adhesive shall be spread uniformly over the underside of the raised pavement marker to a depth of approximately 10 mm. The raised pavement marker shall be pressed down onto the pavement surface in its correct position and shall be rotated slightly until the adhesive is squeezed out around all edges of the marker. The raised pavement marker shall not be disturbed until the adhesive has set. ***Method***

3. On rough surfaces, such as newly laid coarse sprayed bituminous seals, and where directed by the Superintendent, an initial pad of adhesive of diameter 20mm larger than the diameter of the base of the raised pavement marker, shall be provided. The adhesive shall be applied to fill the irregularities in the pavement surface to produce a flat, smooth surface flush with the upper stone level. The adhesive pad shall be allowed to set. Additional adhesive shall be applied to the pavement, as described above, and then the raised pavement marker shall be pressed down onto the adhesive pad on the pavement surface to ensure good adhesion. ***Rough Surfaces***

REMOVAL OF PAVEMENT MARKINGS

C261.23 GENERAL

1. The Contractor shall remove pavement markings, no longer required, from the wearing surface of pavements without significant damage to the surface. The removal of markings shall be performed in a "block type manner, so as to avoid "ghosted" images. Blacking out of markings should only be used as a temporary measure and complete removal should occur within 48 hours. ***Undamaged Pavement***

2. The method of removal shall be approved by the Superintendent before commencement of the work. ***Removal Method***

LIMITS AND TOLERANCES

C261.24 SUMMARY OF LIMITS AND TOLERANCES

1. The limits and tolerances applicable to the various clauses of this Specification are summarised in Table C261.2 below:

Item	Activity	Limits/Tolerances	Spec Clause
1.	**Location of Markings**	±20mm from specified location	C261.06
2.	**Longitudinal Lines**		C261.12
	(a) Length	+20mm -0mm from lengths shown in AS 1742.3	C261.16
	(b) Width	+10mm -0mm (except for double barrier lines where the gap between lines must not decrease) from widths shown in AS 1742.3	C261.12 C261.16
3.	**Transverse Lines**		
	(a) Length)	±10mm from lengths and widths shown	C261.12
	(b) Width)	in AS 1742.3	C261.16
4.	**Arrows, Chevrons, Painted Medians, Speed Markings etc.**	±50mm from the dimensions shown in AS 1742.3	C261.12 C261.16
5.	**Application of Paint**		
	(a) Film Thickness	Depends on the beads to be used: for class B beads – min 0.2mm dry film; for class D beads – min 0.3mm dry film	C261.12
6.	**Application of Thermoplastic**		
	(a) Longitudinal Lines - Cold Film Thickness	3.0mm ± 0.5mm	C261.16
	(b) Transverse Lines, Symbols, Arrows etc. Cold Film Thickness	3.5mm ± 1.5mm	C261.16
7.	**Glass Beads**		
	(a) Volume used in operation	Min class B - 0.30 kg/m^2 Min class D - 0.50 kg/m^2	C261.12 C261.16

Table C261.2 - Summary of Limits and Tolerances

SPECIAL REQUIREMENTS

C261.25 RESERVED

C261.26 RESERVED

C261.27 RESERVED

MEASUREMENT AND PAYMENT

C261.28 PAY ITEMS

1. Payment shall be made for all activities associated with completing the work detailed in this Specification on a schedule of rates basis in accordance with Pay Items C261(a) to C261(e) inclusive.

2. A lump sum price for any of these items shall not be accepted.

3. If any item, for which a quantity of work is listed in the Schedule of Rates, has not been priced by the Contractor, it shall be understood that due allowance has been made in other items for the cost of the item which has not been priced.

4. No additional payment shall be made for maintenance and replacement of pavement markers in accordance with Clause C261.09.

5. Provision for traffic is measured and paid in accordance with this Specification and not in the Specification for CONTROL OF TRAFFIC.

Pay Item C261(a) PAVEMENT MARKING PAINT - LONGITUDINAL LINES

1. The unit of measurement shall be per line pattern kilometre (including any gaps).

2. The area shall be calculated from the specified width (excluding tolerances) and the actual application length measured along the centre line of the longitudinal line.

3. The schedule rate shall cover all costs associated with the setting out of the work, the supply and application of the paint and beads and provision for traffic control.

Pay Item C261(b) PAVEMENT MARKING PAINT - TRANSVERSE LINES, SYMBOLS, LEGENDS, ARROWS, CHEVRONS, TRAFFIC ISLANDS AND KERBS

1. The unit of measurement shall be as per schedule below;

Transverse lines	lineal metres
Arrow	Each
Symbols	Each
Chevrons	Square Metres
Kerbs	Metres
Traffic Islands	Square Metres
Legends	Each or Square Metres.

2. The area of the painted surface shall be determined by direct measurement of the markings as applied.

3. The schedule rate shall cover all costs associated with the setting out of the work, the supply and application of all material and the provision for traffic control.

Pay Item C261(c) THERMOPLASTIC PAVEMENT MARKING MATERIAL - LONGITUDINAL LINES

1. The unit of measurement shall be per line pattern kilometre (including any gaps).

2. The area shall be calculated from the specified width (excluding tolerances) and the actual application length measured along the centre line of the longitudinal line.

3. The schedule rate shall cover all costs associated with the setting out of the work, tack coating where necessary, the supply and application of the thermoplastic material and beads and provision for traffic.

Pay Item C261(d) THERMOPLASTIC PAVEMENT MARKING MATERIAL - TRANSVERSE LINES, SYMBOLS, LEGENDS AND ARROWS

1. The unit of measurement shall be as per schedule below;

Transverse lines	lineal metres
Arrow	Each
Symbols	Each
Chevrons	Square Metres
Kerbs	Metres
Traffic Islands	Square Metres.
Legends	Each or Square Metres.

2. The surface area of the thermoplastic material applied shall be determined by direct measurement of the markings as applied (as above).

3. The schedule rate shall cover all costs associated with the setting out of the work, tack coating where necessary, the supply and application of all material and the provision for traffic.

Pay Item C261(e) RAISED PAVEMENT MARKERS (all applications)

1. The unit of measurement shall be 'each' raised pavement marker installed.

2. The schedule rate shall cover all costs associated with the setting out of the work, the supply and application of all material including the provision of an initial pad of adhesive when required on rough surfaces and the provision for traffic.

ANNEXURE C261A

PROCEDURE FOR MEASUREMENT OF RATE OF APPLICATION OF SPHERICAL GLASS BEADS

1. SCOPE

The following procedure shall be adopted for field measurement of the rate of application of spherical glass beads on to wet paint or thermoplastic surfaces.

2. SPHERICAL GLASS BEADS

The glass beads shall comply with AS 2009.

3. MEASUREMENT

The method of field measurement shall be as follows:

(a) Turn off the paint or thermoplastic supply valves and operate the glass bead dispenser for exactly 10 seconds allowing glass beads to run into a plastic bag or tray.

(b) Pour the glass beads from the bag or tray into a suitable measuring cylinder calibrated in millilitres to measure the volume of glass beads collected. Level but do not compact the glass beads in the cylinder.

(c) Compare the volume of glass beads collected with the correct figure given in Table C261.1.

Table C261.1 shows the correct volumes of glass beads required to give a net application rate on the marked line of approximately 0.30 kilograms per square metre for different line widths and road speeds. The glass bead volume figures given in Table C261.1 are calculated for an actual application rate of 0.34 kilograms per square metre. These figures are used for calibrating the machine because there is a loss of beads between the bead dispenser and the marked line and the volume is measured with beads not compacted. For the calibration of application rates to suit class D beads, the above table will need to be altered to 0.50kg/m^2.

ANNEXURE C261B

TYPES OF GLASS BEADS

1. CLASS A BEADS (PREMIX)

Class A beads are mixed into road-marking material by the manufacturer prior to application, and are intended to provide retroreflectivity throughout the life of the marking. These beads are to be mixed at a rate of not less than 30% by mass.

2. CLASS B BEADS (DROP-ON)

Class B glass beads are applied under gravity or pressure as a surface application to a wet film of pavement marking to provide initial retroreflectivity. These beads should be applied on a smooth substrate. A nominal rate of 270-300 g/m^2 may be appropriate, while a coarse surface substrate usually requires a higher application rate to achieve the required level of retroreflectivity.

NOTE: These beads have a moisture-proof coating to facilitate flow and reduce the risk of "caking"'

3. CLASS C BEADS (INTERMIX)

Class C beads are mixed into thermoplastic road-marking material by the manufacturer prior to application, and are intended to provide retroreflectivity throughout the life of the marking. They should be intermixed at a rate of not less than 20% by mass. Class C beads may also be used for surface applications to a wet film of pavement marking to provide initial retroreflectivity. They should be applied on a smooth substrate. A nominal rate of 350 g/m^2 may be appropriate, while a coarse surface substrate usually requires a higher rate of application to achieve the required level of retroreflectivity.

NOTE: These beads are not moisture-proof coated, and, if used for surface applications, could "cake" during handling.

4. CLASS D BEADS (LARGE WET-WEATHER BEADS)

Class D glass beads are applied under gravity or pressure as a surface application to a wet film of pavement marking to provide initial retroreflectivity. They should be applied on a smooth substrate. A nominal rate of 500 g/m^2 may be appropriate, while a coarse surface substrate usually requires a higher rate of application to achieve the required level of retroreflectivity.

NOTE: These beads have no moisture-proof coating and are, therefore, also suitable for intermixing into thermoplastic road-marking material to provide retroreflectivity in both dry and wet conditions, throughout the life of the marking. They should be intermixed at a rate of not less than 20% by mass.

SPECIFICATION C261 - PAVEMENT MARKINGS

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