



Specification No 799
Tactile Ground Surface Indicators
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1. GENERAL

1.1. SCOPE

This Specification is Council's Specification for the supply and installation of tactile ground surface indicators (TGSIs) for all road, footpath and building infrastructure works undertaken in Wyndham.

This Specification should be read together with Council's Design Notes for this Specification.

1.2. REFERENCES

Australian and Australian/New Zealand Standards are referred to in abbreviated form. The full titles of the Standards are set out below:

Australian Standards

AS 4586-2013 – Slip resistance classification of new pedestrian surface materials.

Australian/New Zealand Standards

AS/NZS 1428.4.1-2009 (Incorporating Amendments No. 1:2010 and 2:2014) – Design for access and mobility Part 4.1: Means to assist the orientation of people with vision impairment – Tactile ground surface indicators.

1.3. DEFINITIONS

The following definitions apply:

Composite Discrete TGSIs means TGSIs that are individually installed, and which provide a differing luminance for the sloping sides and upper surface of the truncated cone.

cue means any object within the environment which can be felt, heard, seen or smelt by a blind or vision impaired pedestrian.

depth means depth as measured along the direction of travel when encountering the TGSi.

Directional Indicators mean a textured surface feature consisting of directional grooves built into or applied to walking surfaces to give directional orientation to blind and vision impaired people.

direction of travel means the path a person travels along which may be a footpath, passageway, walkway, ramp, stairs, landing or similar.

Discrete TGSIs mean TGSIs that are individually installed, which provide the same luminance for the sloping sides and upper surface of the truncated cone.

Integrated TGSIs mean TGSIs that are in a defined pattern and which are of the same luminance and material as the base surface.

luminance contrast means the light reflected from one surface or component, compared to the light reflected from another surface or component.

orientation means a person’s awareness of where they are in relation to their environment.

TGSIs mean truncated cones or bars installed on the ground or floor surface designed to provide pedestrians who are blind or vision impaired, with warning or directional orientation information.

vision impaired means vision difficulties that cannot be adequately corrected by spectacles or contact lenses. Blindness implies severe impairment including a total or near total loss of the ability to perceive form and is referred to as “blind and vision impaired”. Reference to vision impaired implies a person has sufficient residual vision to benefit from bold, high contrast visual cues.

Warning Indicators mean a textured surface feature consisting of truncated domes built into or applied to walking surfaces to warn blind and vision impaired people of a nearby hazard.

2. PRODUCTS AND MATERIALS

2.1. GENERAL

2.1.1. TGSIs are designed to provide pedestrians with visual and sensory information. The two types of TGSIs installed in Wyndham are Warning Indicators and Directional Indicators:

Warning Indicators alert pedestrians to hazards in the continuous accessible path of travel, indicating that they should stop to determine the nature of the hazard before proceeding further.

Directional Indicators give directional orientation to blind and vision impaired people and designate the continuous accessible path of travel when other tactile or environmental cues are insufficient.

2.1.2. The visual contrast between the walking surface and surrounding environment are critical for vision impaired people who are using their limited residual vision for orientation, distinguishing the limits of the footpath, recognising hazards and gathering information. Therefore, contrast is especially important in the provision of TGSIs to warn users of hazards. TGSIs must provide a high visual contrast to the adjoining walking surface.

2.1.3. TGSIs must be installed so that there is no likelihood of the edges lifting. For this reason, Council does not approve the use of surface stick-on type TGSIs, unless additional mechanical fastenings (e.g. screws) are used.

2.1.4. Discrete TGSIs are not permitted for use in Wyndham unless there are contract specific requirements for their use.

2.1.5. Council does not recommend any specific TGSIs for particular applications.



2.2. WARRANTY OF PRODUCT

- 2.2.1. Council requires a warranty in respect of the Product (TGSIs) and its installation that names Wyndham City Council as the beneficiary and is for a minimum period of five years. **The form of the warranty required by Council is attached at Appendix One to this Specification.**
- 2.2.2. For the period of the warranty, the Product supplier must, within 45 business days, at no cost to Council, correct all defects and omissions in the Product and/or its installation, by way of repair, replacement or modification. If the Product fails to comply with the requirements of this Specification during the warranty period, the supplier must replace the Product at no cost to Council.
- 2.2.3. Any supplier warranty in respect of the Product and/or its installation for the benefit of a third party must be assigned to Council.

2.3. MATERIAL

- 2.3.1. TGSIs must be manufactured from fibre reinforced polymer and use of TGSIs manufactured from an alternative material requires specific Council approval.
- 2.3.2. TGSIs manufactured from ceramic, rubber, or plastic material are not permitted for use in Wyndham.

2.4. COLOUR

- 2.4.1. Installations on plain concrete surfaces must be white to achieve whole of life luminance contrast.
- 2.4.2. Alternative colours proposed for sites that require other than plain concrete must be approved by Council prior to installation with supporting luminance contrast test results provided with the application.

2.5. DIMENSION, SHAPE AND SPACING

2.5.1. Warning Indicators

The design and arrangement of Warning Indicators must comply with Figure 2.1 of AS/NZS 1428.4.1.

2.5.2. Directional Indicators

The design and arrangement of Directional Indicators must comply with Figure 3.1 of AS/NZS 1428.4.1.

2.6. INSTALLATION

2.6.1. Warning Indicators

Warning Indicators must be installed in accordance with section 2.3.3 of AS/NZS 1428.4.1.

2.6.2. Directional Indicators

Directional Indicators must be installed in accordance with section 3.2.3 of AS/NZS 1428.4.1.

2.7. SLIP RESISTANCE

2.7.1. TGSIs must be tested for slip resistance in accordance with AS 4586 and satisfy the following minimum requirements:

- (a) Wet Pendulum Test Classification: P4 for flat surfaces and P5 for inclines; and
- (b) Oil Wet Ramp Test Classification: Class R10 or better.

2.7.2. TGSIs must retain their slip resistance. This can be demonstrated by slip resistance testing in accordance with AS 4586 after an appropriate accelerated aging or wear test procedure.

2.7.3. Manufacturer slip resistance testing results must be provided to Council together with confirmation that the product slip resistance classification remains current and that the product and process have not changed.

2.8. LUMINANCE CONTRAST

2.8.1. The luminance contrast of TGSIs is the difference in the amount of light reflected from the TGSIs compared to the amount of light reflected from the background or adjacent path of travel.

2.8.2. Luminance contrast must be measured in accordance with AS/NZS 1428.4.1 Appendix E, section E3 and must satisfy the following requirements:

- (a) Where the TGSIs are Integrated TGSIs, they must have a minimum luminance contrast of 30% compared to the amount of light reflected from the surface of the adjacent path of travel.
- (b) Where the TGSIs are Discrete TGSIs having the same luminance for the sloping sides and upper surface of the truncated cones, they must have a minimum luminance contrast of 45% compared to the amount of light reflected from the surface of the adjacent path of travel.
- (c) Where the TGSIs are Composite Discrete TGSIs having differing luminance for the sloping side and upper surface of the truncated cones, they must have a minimum luminance contrast of 60% compared to the amount of light reflected from the surface of the adjacent path of travel.


2.9. UV STABILITY

TGSI material and colours that are likely to degrade in sunlight must be UV stabilised.

2.10. TEST REPORTS AND OTHER DOCUMENTATION

2.10.1. The TGSI supplier must provide manufacturer certificates and test results for laboratory testing carried out by a NATA approved testing authority for:

- (a) TGSI design (size and spacing) compliant with AS 1428.4.1.
- (b) Luminance Contrast AS/NZS 1428.4.1, Appendix E



Calculated luminance contrast values must be submitted together with the laboratory test values of mean luminance reflectance values for the products and common background materials. Council may at its discretion require onsite testing of actual luminance contrast values.

(c) Slip Resistance/Abrasion Resistance

(i) Wet Pendulum Test (AS 4586, Appendix A); and

(ii) Oil Wet Ramp Test Method (AS 4586, Appendix D).

(d) UV stability

Evidence of the use of UV stabilization compounds or accelerated weathering tests, if applicable.

2.10.2. In the case of stick-on type TGSIs, evidence that there is no likelihood of the edges lifting, through the additional use of mechanical means (e.g. screws into ready-formed holes).

2.10.3. Installation and product manuals for all TGSIs.

3. INSTALLATION

3.1. METHOD OF INSTALLATION

In the absence of any other documents approved by Council, all components of a TGSIs as well as the installation methodology must conform to the manufacturer's requirements. The methods of installation include:

(a) In-built into substrate (Integrated TGSIs tile);

(b) Adhesive Fixing (Integrated TGSIs tile); or

(c) Mechanical Fixing (Integrated TGSIs tile).

3.2. IN-BUILT INTO SUBSTRATE

3.2.1. Council's required method of installation for Integrated TGSIs tiles is in-built into substrate. For new surfacing, TGSIs must be in-built at the time of substrate construction in order to avoid the likelihood of the TGSIs coming off due to weak adhesion/bonding between the substrate and tiles.

3.2.2. Specific attention must be given to ensuring that TGSIs are installed flush with the surrounding surface so as not create a trip hazard.

3.3. ADHESIVE FIXING

3.3.1. To ensure satisfactory bonding of TGSIs to the surface, it is a Council requirement that this method of fixing be supplemented by mechanical means (e.g. use of screws into the substrate).

- 3.3.2. TGSIs must be installed with high strength adhesive specified by the manufacturer, on a smooth, flat and dry surface to ensure the adhesive has maximum surface area contact.
- 3.3.3. For Integrated TGSIs, the edge of the base surface must not be more than 3mm above the surrounding surface and have all exposed external edges chamfered.

3.4. MECHANICAL FIXING

- 3.4.1. In mechanical fixing, TGSIs with a stem or spigot that protrudes into the substrate are used instead of TGSIs with a flat base. This method is ideal to retrofit Discrete TGSIs after the substrate has been laid or on an existing substrate. The mechanical fixing mechanism may be supplemented through the use of an adhesive.
- 3.4.2. For mechanical fixing, drilling templates must be used as a guide and correct diameter holes drilled into the substrate to the minimum depth specified by the manufacturer.



APPENDIX 1
WARRANTY OF PRODUCT

1. The supplier warrants to Wyndham City Council (Council) that for the minimum Warranty Period of five years [from the following applicable scenario];
 - i) Council contract works – from the date the works under contract achieved Final Completion (end of defects liability period),
 - ii) Development works (Subdivision development) – from the date that the development stage of works is issued Engineering Statement of Compliance,
 - iii) Third party works (including where Council consent for works is issued) – On completion of the works to Council’s satisfaction,

the Product and its installation will be:

- (a) in accordance with the quality and standard prescribed by the Specification, or where no standard is prescribed, a standard consistent with the best industry standards for a product of a nature similar to the Product;
 - (b) in accordance with all relevant legislation and Australian Standards and Australian/New Zealand Standards produced by Standards Australia (to the extent that the Australian Standards and Australian/New Zealand Standards are not inconsistent with the Specification or legislation); and
 - (c) of acceptable quality and fit for the purpose for which the Product and its installation are required (as set out in or inferred from the Specification/contract).
2. If during the Warranty Period the Product or its installation shows omissions, or defects or deterioration (as to safety, utility, performance, appearance or otherwise) to such an extent that in the opinion of Council the Product or its installation breaches the warranties set out in section 2.2 of the Specification, the supplier is liable, at no cost to Council, to promptly rectify the breach in the manner directed by Council, which may involve reinstatement, replacement, repair or rectification as determined by Council, so that to the reasonable satisfaction of Council the Product and its installation comply with the requirements of this Specification/contract.
3. In order to make a warranty claim, Council must give written notice:
 - (a) of any breach of the warranties set out in section 2.2 of the Specification;
 - (b) directing the manner of rectifying the breach;
 - (c) directing the time within which the breach must be rectified.
4. If the supplier fails to fully and properly rectify the breach within the time directed under paragraph 3(c), the supplier is deemed to have relinquished its rights to rectify the breach, and Council may at any time thereafter arrange for the breach to be rectified (which may involve reinstatement, replacement, repair or rectification as determined by Council) and the costs incurred by the Principal will be a debt due from the supplier to Council.

5. Upon the supplier rectifying a breach of the warranties set out in paragraph 1, the supplier is deemed to have given a further warranty for the reinstated, replaced, repaired or rectified Product and its installation on the terms of this warranty for a period of five further years.
6. The supplier indemnifies and keeps indemnified Council against all direct, indirect or consequential loss, cost, expense or damages of any nature whatsoever suffered or incurred by Council arising directly or indirectly out of:
 - (a) any breach of the warranties set out in paragraph 1 howsoever arising;
 - (b) the rectification of the Product or its installation in accordance with paragraph 4; or
 - (c) any act or omission (including any negligence, unlawful conduct or wilful misconduct) by the supplier relating to this warranty.
7. This warranty is in addition to and does not derogate from any other rights of Council in respect of the Product and its installation, including any manufacturer's warranty or any guarantee imposed by law.
8. A single or partial exercise or waiver by the supplier or Council of a right relating to this warranty does not prevent any other exercise of that right.