



8500 Tactile Ground Surface Indicators

REVISED 04/03/2024

8500.1 Introduction

This supplementary specification applies to the supply and installation of Tactile Ground Surface Indicators (TGSIs) on footpaths, medians, at road grade refuges, and ramped pedestrian crossings.

This supplementary specification covers TGSi installation to both existing surfaces (retrofitting of TGSi), and new works.

8500.1.1 Definition of Terms

This section describes any term which are specific to this specification or requires clarification due to an ambiguous understanding.

Term	Definition
Discrete TGSi	Individual hazard or directional indicators (polymer tiles, studs or bars for example) affixed into or atop of existing or new surfaces; most suited for retrofit situations and suited to new works.
Integrated TGSi	Individual hazard or directional indicators (masonry pavers for example) recessed and set into new pavements; suited for integration within new works only.

8500.2 Referenced Documents

This supplementary specification shall be read in conjunction with the following:

- MRS01 *“Introduction to Specifications”*;
- MRTS01 *“Introduction to Technical Specifications”*
- MRS14 & MRTS14 *“Road Furniture”*
- MRS45 & MRTS45 *“Road Surface Delineation”*;
- AS/NZS1428 Suite *“Design for access and mobility”*;
- AS/NZS 1428.4.1:2009 *“Design for access and mobility, Part 4.1: Means to assist the orientation of people with vision impairment – Tactile ground surface indicators”*;
- AS 4586:2013 *“Slip resistance classifications for new pedestrian surface materials”*;
- AS 1742 *Manual of Uniform Traffic Control Devices*
- TMR’s *“Compliant Products Register for Tactile Ground Surface Indicators (TGSi)”*; and
- the project Drawings.

8500.3 Description of Works

Work items incorporated by this supplementary specification are identified in Section 8500.6 and 8500.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8500_1 Tactile Ground Surface Indicators Section 1



8500.4 Quality Systems Requirements

8500.4.1 Std Test Methods (Testing Regime)

The following minimum testing regime applies to this specification:

Civil works activities associated with concrete pours shall be tested as per the relevant MRTS specification MRTS04 and MRTS70 unless otherwise approved by the Superintendent.

Geometric requirements of the fence installation shall be surveyed to ensure compliance with the design drawings and AS1428.1

8500.4.2 Hold Points, Witness Points and Milestones

The following table represents the minimum inspection requirements for this specification;

Activity	Inspection Type	When
Construction Procedure and other submissions as required by Clause 8500.5	Milestone	4 Weeks prior to works commencing
Inspection of delivered items	Hold Point	At delivery time for each item.
Removal of existing TGSIs	Witness Point	Prior to preparation of surface commencing
Final location of TGSIs and site works extents	Hold Point	During site survey layout.
Preparation of Surface	Hold Point	Prior to installation works commencing
Provision and placement of integrated 'paver' type TGSIs and to confirm their location and placement level	Hold Point	At commencement of pouring of concrete and after pavers have been installed
Drill holes for TGI stems (as required)	Witness Point	Prior to installation works commencing
Installation of TGSIs	Hold point	At completion of installation
Finishing and Sealing TGSIs	Witness Point	At completion of installation prior to setting of adhesive agents
Works as Executed documentation	Hold Point	4 weeks prior to practical completion being requested.

8500.4.3 Construction Tolerances

Unless otherwise approved by the Superintendent the following construction tolerances shall apply to this Specification;

The construction activity outcome shall not depart from the widths, lengths, heights, and shapes specified by the relevant specifications as applies to this specification;

- Concrete tolerances in accordance with MRTS70 Concrete.
- Fencing/Handrail tolerances in accordance with AS1428.1 Design for access and mobility, Part 1: General requirements for access — New building work

Tolerances specific to the project are detailed on the design drawings and are included in Clause 2 of MRC Supplementary Specification Annexure 8500_1 Tactile Ground Surface Indicators



8500.5 Preliminary

The Contractor is to submit the following documentation 4 weeks prior to commencing work or a prestart is conducted. **(MILESTONE)**:

- Works procedure
- Traffic Management Plan and TGS's

Other requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8500_1 Tactile Ground Surface Indicators **(MILESTONE)**

8500.5.1 Materials

Supply of all materials to site is the responsibility of the Contractor at their cost, where items are Principal supplied the nominated storage site shall be obtained from MRC Supplementary Specification 8500.1 Section 3 and shall be the point of supply.

Existing tactile ground surface indicators to be taken up and disposed of will be detailed in design drawings unless otherwise listed in MRC Supplementary Specification 8500.1 Section 4 including the nominated storage site. This will also detail any reuse of existing items as required by the design drawings.

Products are to be sourced from suppliers included in Transport and Main Roads' *"Compliant Products Register for Tactile Ground Surface Indicators (TGSi)"*. Council's preferred TGSi product for discrete applications for retrofit installations are fibre reinforced polymer tiles, installed with both glue and screws to prevent corner lifting and curling.

Notwithstanding the compliant products register, all TGSIs shall conform to AS1428.4.1 requirements for slip rating, colour luminance contrast and tactile indicator dimensions, and the material requirements specified elsewhere in this supplementary specification.

Minimum allowable slip resistance rating of P4/R11 is required of all TGSi products.

Where TGSIs have been nominated as 'yellow', they shall be safety yellow in colour (Golden Yellow Y14 or Sunflower Y15 – AS2700) unless noted otherwise on the drawings.

All polymer compound products are to be UV stabilised.

8500.5.1.1 Discrete Tactile Ground Surface Indicators

Discrete TGSIs shall be a fibre reinforced polymer tile, or full stainless steel product. The fibre reinforced polymer tile must be installed to the surface with both mechanical (e.g. screws) and chemical (e.g. adhesives) applications. The 'stick down' pad type TGSi (chemical bond only) is no longer accepted by Council.

Black and yellow colour contrast inserts to stainless steel hazard 'stud' type TGSi shall be coloured polymer or carborundum.

Composite stainless steel (cap) and polymer (stem/spigot and colour insert) type unit products shall not be used.

Stainless steel 'stud' and 'bar' TGSIs shall be 316 marine grade. Minimum stem/spigot depth to be 10-12mm embedment into surface substrate.

Polymeric studs are to have a minimum stem/spigot embedment depth of 20-25mm and to be installed as per the manufacturer's recommendations.

8500.5.1.2 Integrated Tactile Ground Surface Indicators

Integrated TGSIs shall be either a concrete or natural stone masonry paver product. Ceramic tiles shall not be used. Integrated TGSIs shall only be installed in pedestrian paths, raised medians, and ramps.

Integrated TGSIs shall not be installed in at grade road refuge situations on asphalt surfaces.



TGSIs in pedestrian only environments shall have a minimum depth of 40mm and a minimum product compression strength of 48 mPa. Depth and compression strength of products used where vehicular traffic is likely shall be as shown on the drawings, or where not shown, to the advice of MRC Manager Technical Services.

Where integrated TGSIs have been nominated, they shall be supplied with documentation that they conform to AS1428.4.1:2009, including conformance with luminance contrast requirements.

8500.5.1.3 Adhesion Agent and Grout

The adhesion agents and grouts for discrete and integrated TGSIs products shall be as per the manufacturer's recommended products. Application rates/thicknesses to be in accordance with the manufacturer's instructions.

Polymeric studs in asphalt surfaces shall not typically require adhesive agents unless otherwise recommended by manufacturer.

8500.5.1.5 Warranties

Stainless steel TGSIs products to have a minimum 10 year manufacturer's warranty.

Polymeric TGSIs products to have a minimum 5 year manufacturer's warranty.

Suppliers are to provide copies of warranties with product deliveries. Warranties to be rated for external/outdoor applications. All products to be installed in accordance with warranty conditions.

8500.6 Construction

This section lays out the works operations with more detail based on specific requirements of this supplementary specification. Some activities may appear to include items which are stated within other specifications, the purpose is to reinforce that requirement specific to this supplementary specification.

8500.6.1 Work Operations

Work operations incorporated in this item will include:

a) Work operations listed in Clause 2.1.5 of MRS01 "Introduction to Specifications";

b) Supply of all materials;

All materials, plant, and labour required to carry out the works including site fabrication under this Specification is to be supplied by the Contractor, where materials are Principal supplied the designated storage site will be the point of supply for the purposes of this Specification.

All items shall be inspected at delivery to site prior to use. Any items which are damaged are not to be used and are to be returned to the supplier. **(HOLD POINT)**

c) Existing TGSIs Removal

The removal of existing TGSIs shall be performed immediately prior to the re-installation of replacement TGSIs where applicable, subject to any minimum waiting periods that may be required for surface preparation. The Contractor's chosen method of removal will be such that any impact on surrounding infrastructure is minimised, and all affected infrastructure will be restored to a like for like condition upon completion of the Works. **(WITNESS POINT)**

d) TGSIs Setout

Spacing and arrangements of all TGSIs to be in accordance with AS1428.4.1, and the project Drawings.

Spacing and arrangement of discrete 'stud' and 'bar' type TGSIs shall be even and installed with the aid of appropriate grid templates for an even and regular finish in accordance with AS1428.4.1.



Typically the discrete polymer tiles shall be square and hard butt jointed to adjacent tiles with a maximum of 0.5mm between units.

The final location of the TGSIs is to be marked out on site and shall be inspected and approved by an MRC representative prior to installation commencing. **(HOLD POINT)**

e) Preparation of surface

New concrete surfaces shall be allowed to cure for 7 days of warm, dry weather prior to installation of TGSIs discrete polymer tile type indicators. Asphalt surfaces shall be allowed to cure for 14 dry days prior to installations.

Where discrete polymer tile type TGSIs are used, surfaces shall be prepared and cleaned completely of dust, dirt and loose materials to provide debris free bonding surface. A combination of scraping, sweeping and vacuum cleaning shall be used depending on site contaminants. Chemical cleaning agents shall be used in more heavily contaminated sites in order to achieve a clean surface finish.

Surfaces must be completely dry prior to installation, with a minimum of 5 days intermission between surface wetting events. **(HOLD POINT)**

f) Provide recessed depressions for indicators in new concrete or asphalt surfaces (if using “paver” type TGSIs) (concrete and asphalt work paid for in other items)

The Contractor shall confirm with the Superintendent at least 24 hours prior to pouring concrete whether provision shall be made for integrated ‘paver’ type TGSIs and to confirm their location. Where integrated ‘paver’ style TGSIs are used, the base of the TGSIs shall be inserted into the concrete or asphalt such that the raised indicators are nominally 4mm above the surrounding surface, in accordance with AS1428.4.1. Integrated pavers shall be installed as per details on the Drawings. **(HOLD POINT)**

g) Provide drill holes in new and existing concrete and asphalt surfaces for discrete stud (hazard type) and bars (directional type)

For discrete stainless steel ‘stud’ and ‘bar’ type TGSIs provide drill holes to surface material set out as required by the manufacturers recommendation to enable all stems can be fixed into these individual drill holes. **(WITNESS POINT)**

h) Installation of Tactile Ground Surface Indicators (TGSIs) as per manufacturer’s recommendations and as to meet warranty conditions

For discrete stainless steel ‘stud’ and ‘bar’ type TGSIs, all stems are to be fixed into the individual drilled holes to the surface material using manufacturer’s recommended chemical adhesion product, or spigot anchor fixing system. In addition ‘bar’ type TGSIs are to have recommended adhesion agent applied to cover entire base area of the bar to promote maximum contact with surface material.

Directional ‘bar’ and ‘tile’ type TGSIs shall be laid as flat as possible and not be bent over ramp hinge points or other sharp grade changes to mitigate risk of base failing to make contact with surface. Adjust setout as required to mitigate the need to bend individual units. Polymer tile type TGSIs must be mechanically secured to the surface as per manufacturer’s specifications, as well as chemically bonded with adhesives.

Neatly and squarely butt join all tiles to adjacent tiles and tap down with a wooden block and hammer across entire surface area to ensure bonding to substrate. Particular care to be taken in ensuring firm contact between edges, corners and surface to mitigate water and dust ingress under tile. Allow 72 hours for bonding agents to achieve maximum optimum contact before opening to foot traffic. **(HOLD POINT)**

i) Finishing and Sealing

All surface residue of bonding agents squeezed out from under TGSIs shall be cleaned off following installation, and prior to setting to maintain clean surface appearance.



Following installation of polymeric tiles, apply a bead of silicone based adhesive sealant around the full perimeter of the laid TGSi to prevent ingress of water and dirt under tile edges. Smooth off sealant around tile perimeter to create a clean rounded join between sides of tile and surface. **(WITNESS POINT)**

j) Clean up of Site

The site is to be cleaned of all debris and construction materials

8500.7 Post construction

a) Collection and submission of all As Constructed data including QA data requirements.

Contractor is to supply and submit Works as Executed documentation as required by *MRC D20 - Drawings and Documentation* for approval by the Superintendent 4 weeks prior to requesting a practical completion inspection. **(HOLD POINT)**

Certification of works to AS1428.1 shall be submitted with the “Works as Executed” Plans and documentation.

Format of submitted “As Constructed” documentation shall be compliant with MRC Supplementary Specification 8919.

8500.8 Measurement and Payment

Work Operations under this Specification shall be claimed under the items shown in Clause 8500.3 of this Supplementary Specification and Annexure as measured by the total number of square metres shown in the design drawings. No separate payment will be made for the works specified within this Supplementary specification or it’s annexure.

Version Control:

Version	Description	Reviewed / Endorsed	Date
1.0	Original issue	MRC	16.10.2020
2.0	Review of Specification	C. Sultana	03.04.2024