

Technical Note – Specification and Application for Portable signals

Portable traffic signal systems

Version 3: November 2015

Portable traffic signal systems are used for temporary traffic control on sites where:

- a) Because of roadworks or other temporary obstruction, a section of road has been reduced in width to one lane or must be closed to through traffic periodically; or
- b) A temporary intersection has been created to allow construction vehicles or other vehicles to cross or enter a roadway.

Use of portable traffic signal systems on the New Zealand State highway network is governed by the New Zealand Transport Agency's (NZTA, formerly Transit New Zealand's) *Code of Practice for Temporary Traffic Management (COPTTM)* and systems used must be certified compliant to AS 4191 *Portable traffic signal systems* or Approved by NZTA as compliant to the requirements of this document.

NZTA requires that the maximum duration for a particular portable traffic signal system installation be only two months. If the same traffic signal system installation is required for more than two months fixed traffic signals must be used and alternative Specifications apply.

The intent is for road users to perceive and respond to portable traffic signal systems similar to as they do to Approved fixed permanent traffic signal systems.

1 The Approval Process

1.1 Provisional Approval and Approval

The Traffic and Safety Manager of NZTA may issue Provisional Approval of a portable traffic signal system for use on the State highway network if the system is assessed as meeting the requirements described in this document.

If the Traffic and Safety Manager believes a portable traffic signal system with Provisional Approval is not meeting the requirements of ongoing Provisional Approval, its Provisional Approval will be revoked and that system will be removed from the List of Approved Products.

The Traffic and Safety Manager may issue Approval of a portable traffic signal system for use on the State highway network if the system has held Provisional Approval for two years, or more, and provided satisfactory in-situ performance during that time.

If the Traffic and Safety Manager believes a portable traffic signal system with Approval is not meeting the requirements of ongoing Approval, the Supplier will be informed and have thirty days to submit information to justify ongoing Approval. The Traffic and Safety Manager will review the information and issue ongoing Approval for the portable traffic signal system or its Approval will be revoked and that system will be removed from the List of Approved Products.

1.2 Advice of issue of Provisional Approval

The Traffic and Safety Manager will advise the Supplier of Provisional Approval or rejection of their portable traffic signal system within four weeks of the Supplier's submission of the Assessment Report. The List of Approved Products will also be updated accordingly within this period.

1.3 List of Approved Products

Technical Note – Specification and Application for Portable signals

Portable traffic signal systems with Provisional Approval or Approval from the Traffic and Safety Manager of NZTA are on a List of Approved Products. The List of Approved Products is maintained by NZTA and is published on its website: www.transit.govt.nz. Each entry on the List of Approved Products will:

- a) Include sufficient details, such as system model and design specifications, so that the portable traffic signal system with Approval is uniquely identified.
- b) State whether the portable traffic signal system is, or is not, Approved for:
 - i) Vehicle-actuated operation;
 - ii) Remote manual control (with Maximum Remote Distance¹ noted).
- c) State the Maximum Site Length² for which the portable traffic signal system is Approved for.

Portable traffic signal systems added to the List of Approved Products can remain on the List of Approved Products at the discretion of the Traffic and Safety Manager of NZTA. Suppliers should note Provisional Approval and Approval apply only to the specific system originally assessed and Approved. Any modification, even minor modifications, to the portable traffic signal system will require reassessment and Approval before being eligible for use on the State highway network.

2 The Assessment Process

2.1 Assessment Report

The Traffic and Safety Manager of NZTA will Approve or reject a portable traffic signal system based on its Assessment Report. The Assessment Report shall contain:

- a) Full details, including system model and design specifications, of the portable traffic signal system nominated for Approval;
- b) Record of assessments against each requirement of Section 3 of this document (or justification where a requirement has not been assessed);
- c) Copies of any documentation that the Supplier has provided to the Assessment Agency during the assessment; and
- d) Any other comment that the Assessment Agency considers significant to the assessment of the portable traffic signal system.

The Assessment Report shall include a recommendation from the Assessment Agency as to whether the Traffic and Safety Manager of NZTA should Approve the portable traffic signal system.

2.2 Assessment Agencies for assessment against this Technical Note

Assessment of a portable traffic signal system against the requirements of this document shall be completed by an Assessment Agency Approved by NZTA at the time of testing.

A List of Approved Assessment Agencies is maintained by NZTA and is published on its website: www.transit.govt.nz. The Assessment Agencies are deemed by NZTA to provide agents appropriately independent, competent, and physically able (including visual acuity) to perform assessment of portable traffic signal systems.

3 Approval via this Technical Note

¹ Remote Distance is the distance between the "remote control" and a traffic signal being controlled by that "remote control".

² Site Length is the distance between the traffic signal limit lines at each end of the site.

Technical Note – Specification and Application for Portable signals

3.1 Prerequisite

Approval of a portable traffic signal system via assessed compliance with the requirements of Section 3 of this Technical Note will only be considered if the traffic signal lantern of the portable traffic signal system is certified compliant to any of the following:

- a) AS/NZS 2144 Traffic signal lanterns; or
- b) EN 12368 *Traffic control equipment - Signal heads*; or
- c) TR 2206A *Specification for road traffic signals*; or
- d) ITE *Equipment and material standards*; or
- e) ITE VTCSH *Light emitting diode circular signal supplement*; or
- f) ISO 16508 (CIE S 006.1) Road traffic lights - Photometric properties of 200 mm roundel signals; or
- g) Another Standard accepted by the Traffic and Safety Manager of NZTA.

Any system that uses radio communications will need to comply with the appropriate New Zealand Regulations. This will come under the category of Short Range devices. The frequency(s) used by the system would need to be in a frequency range designated for unrestricted use, and the transmitter power must be less than the Peak Power allowed for that frequency range. A compliance test report to AS/NZS 4268 (radio equipment and systems – Short range devices – Limits and methods of measurement) or an equivalent international standard is acceptable evidence of this.

3.2 The assessment process

At a location and time agreed with the Assessment Agency, the Supplier shall provide the portable traffic signal system for which Approval is being sought. The Supplier shall have the portable traffic signal system fully installed and shall supply a system operator so that the portable traffic signal system is fully functional during the assessment.

The Assessment Agency will inspect all the Appearance requirements (Section 3.4 of this Technical Note) and require demonstration of all the Functionality requirements (Section 3.5 of this Technical Note).

The Assessment Agency will record and report the distance between the two traffic signal lanterns as the Maximum Site Length assessed for that portable traffic signal system.

3.3 Documentation requirements

This Technical Note is primarily produced in acknowledgement that many portable traffic signal systems incorporate components that are certified compliant to Standards other than AS 4191. The Supplier of the portable traffic signal system shall provide the Assessment Agency with:

- a) The certification of each of the relevant primary Standards or legislation which components of the portable traffic signal systems are compliant to.
 - i) The Standards or legislation can be from New Zealand, such as Warrant of Fitness and Registration for any trailers of the portable traffic signal system; or
 - ii) The Standards or legislation can be from overseas, such as AS 2339 *Traffic signal controllers* for the controller of the portable traffic signal system.
- b) Documentation endorsing the nature and integrity of general aspects of the portable traffic signal system for use in New Zealand, including aspects such as:
 - i) The structure of the system under wind loading and vehicle impact;
 - ii) Weather resistance and general range of acceptable environmental conditions for the entire system;

Technical Note – Specification and Application for Portable signals

- iii) Communications, internally between components of the system and externally for any monitoring purposes; and
- iv) Provisions and maintenance of power supply.

The Assessment Report shall record the documentation submitted to the Assessment Agency.

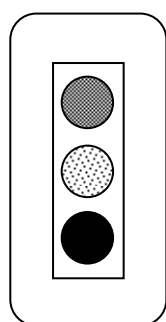
The Supplier of the portable traffic signal system shall also provide the Assessment Agency with a copy of the instruction manual for the system. This instruction manual shall be submitted with the Assessment Report and remain the property of NZTA.

3.4 Appearance requirements

On the approach to a portable traffic signal system a road user should not discern any significant difference between the appearance of the portable traffic signal lantern and the appearance of any fixed three-disc single-column traffic signal lantern Approved for use on New Zealand roads.

At the functioning portable traffic signal system provided by the Supplier, the Assessment Agency will inspect and report findings regarding:

- a) The top of the traffic signal lantern is between 2.5 and 4.0 metres above the road surface.
- b) Besides the portable traffic signal lanterns, the external finishes of other components of the portable traffic signal system appear as gloss golden yellow.
- c) Each separate component of the portable traffic signal system has permanent and prominent identification markings.
- d) Permanent, prominent, and appropriate marking of:
 - i) The maximum period over which the power source will support the portable traffic signal system;
 - ii) The Maximum Site Length of the portable traffic signal system (for the Assessment and Approval);
 - iii) Any controls and indicators for use during operation of the portable traffic signal system;
 - iv) A summary of basic operating procedures for the portable traffic signal system.
 - v) The fuel type to be used, for portable traffic signal systems incorporating a motor-driven generator.
- e) The general appearance of the traffic signal lantern, including target board, is as shown in Figure 1.
- f) Each individual disc display is readily visible from an unimpeded distance of 200 metres in dry daylight conditions.
- g) Each individual disc display is fitted with a visor.
- h) The colour of each individual disc display is:
Figure 1: Portable traffic signal lantern



Red disc	Nominal colour	red
	Nominal dimension	200 mm diameter
Yellow disc	Nominal colour	yellow or amber
	Nominal dimension	200 mm diameter
Green disc	Nominal colour	green
	Nominal dimension	200 mm diameter
Target board	Nominal colours	black with white border
	Nominal dimensions	560 mm wide and 1064 mm high (20 mm wide border)

Technical Note – Specification and Application for Portable signals

- i) readily discernible from a different coloured disc display when two different coloured discs are displayed in sequence; and
- ii) readily recognisable when one colour disc is displayed.

3.5 Functionality requirements

The Assessment Agency will inspect and report findings on the Supplier's demonstration of the functionality of the portable traffic signal system. This shall include:

- a) Start-up sequence preceding Manual Operation:
 - i) Flashing yellow disc display on each traffic signal lantern for a minimum run time of at least 5 seconds; then
 - ii) Steady yellow disc display on each traffic signal lantern for a nominal 4 seconds; then
 - iii) Steady red disc display on each traffic signal lantern for a nominal 10 seconds; then
 - iv) Steady red disc display until manual input.
- b) Start-up sequence preceding Fixed-Time Operation:
 - i) Flashing yellow disc display on each traffic signal lantern for a minimum run time of at least 5 seconds; then
 - ii) Steady yellow disc display on each traffic signal lantern for a nominal 4 seconds; then
 - iii) Steady red disc display on each traffic signal lantern for a nominal 10 seconds; then
 - iv) Automatic commencement of normal phase cycling.
- c) The start-up sequence is automatically called when the portable traffic signal system is switching between operation modes.
- d) General sequence of displays:
 - i) A green disc display followed by a yellow disc display;
 - ii) A yellow disc display followed by a red disc display;
 - iii) A red disc display followed by a green disc display.
- e) Compatibility of displays:
 - i) When one traffic signal lantern has a flashing yellow disc display, the other traffic signal lantern will have a flashing yellow disc display.
 - ii) When one traffic signal lantern has a steady green disc display, the other traffic signal lantern will have a steady red disc display.
 - iii) When one traffic signal lantern has a steady yellow disc display, the other traffic signal lantern will have a steady red disc display.
- f) Flashing Yellow Operation of a flashing yellow disc display on each traffic signal lantern, with the flashing tempo being regular and obvious when:
 - i) Flashing Yellow Operation is selected by the user; and
 - ii) Within 0.5 seconds of the occurrence of any hazardous or incompatible portable traffic signal system condition. (A sample list of such conditions is included in Section 2.8.2 of AS 4191 and in Section B5.1.11 of COPTTM. The Assessment Agency shall select at least 5 such conditions for demonstration during the assessment.)
- g) Manual Operation:
 - i) The all-red disc display can be programmed for a minimum run time as defined in COPTTM and for at least 5 seconds.

Technical Note – Specification and Application for Portable signals

- ii) The green disc display can be programmed for a minimum run time.
- iii) The yellow disc display is programmed to run for a nominal 4 seconds.
- h) Fixed-Time Operation:
 - i) The all-red disc display can be programmed for a set run time as defined in COPTTM and for at least 5 seconds.
 - ii) The green disc display can be programmed for a set run time.
 - iii) The yellow disc display is programmed to run for a nominal 4 seconds.
- i) Shut-down procedure or mechanism that provides continuous clear direction for each approach and ensures no uncontrolled vehicle conflict.

For portable traffic signal systems assessed for Vehicle-Actuated Operation

- j) Vehicle-Actuated Operation:
 - i) The all-red disc display can be programmed for a minimum run time as defined in COPTTM and for at least 5 seconds.
 - ii) The green disc display can be programmed for a minimum nominal run time of at least 6 seconds.
 - iii) The green disc display can be programmed for a maximum run time.
 - iv) If the green disc display of a phase is terminated at its maximum run time, the portable traffic signal system is programmed to switch to another phase and operate as if there is a vehicle-actuation for the original phase.
 - v) The gap time that the portable traffic signal system allows for successive vehicle actuations can be programmed within the range of a nominal 2 to 6 seconds.
 - vi) The yellow disc display is programmed to run for a nominal 4 seconds.
 - vii) When Vehicle-Actuated Operation is initiated the portable traffic signal system operates as if there is a vehicle-actuation at each approach.
 - viii) Vehicle-actuation occurs when a vehicle moving at 10 to 80 km/h, on the approach to the portable traffic signal system, is 5 to 30 metres in front of the traffic signal lantern.
 - ix) No "false" vehicle-actuation is detected by the portable traffic signal system during the assessment.
 - x) No "true" vehicle-actuation is undetected by the portable traffic signal system during the assessment.

For portable traffic signal systems assessed for Remote Manual Control:

- k) Remote Manual Control:
 - i) The standard conditions of Manual Operation can be controlled through a "remote control" via radio or cable communication with the portable traffic signal system.
 - ii) The Assessment Agency will record and report the maximum distance between the "remote control" and a traffic signal lantern being controlled by that "remote control" as the Maximum Remote Distance assessed for that portable traffic signal system.

4 Costs of Assessment and Approval

Regardless of whether the portable traffic signal system is Approved or rejected, any costs incurred in the Assessment and Approval of a portable traffic signal system will be fully met by the Supplier of the system. This includes:

Technical Note – Specification and Application for Portable signals

- a) Any costs incurred in providing an assessment location or transport of the Assessment Agency to that assessment location;
- b) Any costs incurred in the provision, installation, and operation of the portable traffic signal system for inspection;
- c) Any costs incurred in the supply of documentation for the assessment; and
- d) Payment of the Assessment Agency's costs and fee for assessment and reporting.

Note: An operator must be supplied with the signal equipment. (Testing should be completed in one day, provided that the system meets the requirements)

To arrange for testing please contact:

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