# TRAFFIC CONTROL SIGNALS AND INTELLIGENT TRANSPORT SYSTEMS

DIPL Roadworks Master – March 2022

## CROSS REFERENCES

MISCELLANEOUS PROVISIONS, **Services to Cross Below Existing Pavements**

PROVISION FOR TRAFFIC

DUCTING AND CONDUITS

## Standards and Publications

Conform to the following Standards and Publications unless specified otherwise:

### Australian Standards

AS/NZS 1163 Structural steel hollow sections

AS 1231 Aluminium and aluminium alloys - Anodized coatings for architectural applications

AS/NZS 1477 PVC pipes and fittings for pressure applications

AS/NZS 1554(set) Structural steel welding

AS/NZS 1594 Hot rolled steel flat products

AS 1742(set) Manual of uniform traffic control devices

AS 1743 Road signs – Specifications

AS/NZS 2053(set) Conduits and fittings for electrical installations

AS/NZS 2144 Traffic signal lanterns

AS/NZS 2276(set) Cables for traffic signal installations

AS/NZS 2276.1 - Multicore power cables

AS/NZS 2276.2 - Feeder cable for vehicle detectors

AS/NZS 2276.3 - Loop cables for vehicle detectors

AS 2339 Traffic signal posts and attachments

AS 2353 Pedestrian push button assemblies

AS 2700(set) Colour standards for general purposes

AS 2703 Vehicle loop detector sensors

AS 2979 Traffic signal mast arms

AS/NZS 3000 Electrical installations (Australian/New Zealand Wiring Rules)

AS/NZS 3100 Approval and test specification - General requirements for electrical equipment

AS/NZS 3191 Electric flexible cords

AS/NZS 3678 Structural steel - Hot-rolled plates, floorplates and slabs

AS/NZS 3679.1 Structural steel - Hot rolled bars and sections

AS/NZS 4680 Hot dip galvanized (zinc) coatings on fabricated ferrous articles

AS/NZS 5000.1 Electrical cables – Polymeric insulated – For working voltage up to and including 0.6/1 (1.2)kV

AS/NZS 61558(set) Safety of power transformers, power supplies, reactors and similar products

AS/NZS 61558.1 – General requirements and tests

### British Standard

BS 381C-637 Medium sea grey

### Civil Standard Drawings

| **Table – Civil Standard Drawings for Traffic Signals and Intelligent Transport Systems** | |
| --- | --- |
| **Drawing no.** | **Title** |
| CS-1500 | Signal details ducting |
| CS-1501 | Signal details pole foundation |
| CS-1502 | Signal details mast arm foundation |
| CS-1503 | Signal details controller foundation |
| CS-1504 | Signal details communication isolation pillar |
| CS-1505 | Signal details lantern mounting details |
| CS-1506 | Signal details pedestrian push button |
| CS-1507 | Signal details detector installation |
| CS-1510 | Intersection name - Philips PSC MK3 QC12 - ID controller electrical works |
| CS-1511 | Cabinet details |
| CS-1512 | Cabinet base plate mounting details |
| CS-1554 | Traffic control station post mounted cabinet wiring details |
| CS-1557 | Traffic signal advance warning sign |
| CS-3404 | Traffic signal symbols |
| CS-3405 | Traffic signal electrical and phasing tables |

## Concrete

Refer to the MISCELLANEOUS CONCRETE WORKS Section of this Specification for concrete footings and the reinstatement of concrete footways.

## General Equipment And Installation

### Safety

Provide for the safety of vehicle and pedestrian traffic as specified in the PROVISION FOR TRAFFIC Section.

[Ensure that the PROVISION FOR TRAFFIC Section is included]

Enforce safety precautions with regard to power cables.

### Lightning Strikes and Power Surges

Supply and install a 25A surge reduction filter.

Connect in a series configuration with the primary 240 V AC power supply prior to the main circuit breaker, as recommended by manufacturer.

### Pedestals and Supports

Use galvanized posts and fittings. Provide posts in one continuous length without joints.

All welds to be continuous and carried out prior to galvanizing.

Construct footings as specified.

[Ensure drawings CS 1501, CS 1502 are included]

Reinstate footways once footing concrete has cured and pedestals and/or mast arms are installed.

Provide 450 x 450 x 50 lean mix concrete support collar around pedestals. Box out where pedestals are in concrete islands or footways.

### Vehicle Signal Lanterns

Position lantern assemblies (including cowls, louvres, and target boards) so that:

* no part is within 300 mm of the line of the kerb face;
* the top of the assembly is 4.0 metres above the pavement level;
* any arrow aspects are located to the left or right side (as appropriate) of the associated round aspects; and
* they are as specified.

Provide a rectangular target board for all lantern assemblies.

Blank out the unused aspect positions of target boards with a material of similar colour and finish to the target board.

Signal lantern doors to be capable of opening through 90 degrees without having to alter the adjustment of any signal lantern.

Signal Lanterns to be NT Standard LED Type by Aldridge Traffic Systems Pty. Ltd., or a similar product approved by Superintendent before installation.

Maintain the vehicle signal lanterns with a cover of suitable heavy duty material immediately after erection of the signal lantern and prior to commissioning.

Attach the temporary covers neatly so that they remain in place during all weather conditions.

Provide an inspection hole in the cover, to allow for testing of lantern wiring with covers in place.

### Pedestrian Signal Lanterns

Use lanterns with 200 mm diameter lens.

Use symbolic displays.

Position lantern so that

* no part is within 300 mm of the line of the kerb face;
* centre of green lens is 2.2 m above the footway; and
* the signal is clearly visible from the opposite side of the carriageway.

Signal lantern doors to be capable of opening through 90 degrees without having to alter the adjustment of any signal lantern.

Pedestrian Signal Lanterns to be NT Standard LED Type by Aldridge Traffic Systems Pty. Ltd., or a similar product approved by Superintendent before installation.

### Traffic Signal Controller

Locate the controller as specified.

Mount the controller on a concrete foundation block as specified.

[Ensure drawing CS 1503 is included]

Arrange and connect power to the controller, and supply and provide additional plant, equipment or work required by the Power and Water Corporation.

Transport and install the controller in accordance with the manufacturer's specifications.

Supply and install an earth stake.

Test and commission the completed installation.

### Painting

Finish colours for:

* lantern assemblies including backing plates to be matt black; and
* terminal assembly finial caps and controller housing to be Medium Sea Grey (BS 381C-637; Hex #899194  or #8a9194; CMYK 7:2:0:42; RGB 137:145:148).

## Traffic Signal Cabling – HOLD POINT

**Hold Point** – Submit documentation of proposed cable layout for approval prior to commencing installation of cabling.

### Multicore Connecting Cable

Cable used shall be 51 core multicore as per AS/NZS 2276.1 and shall have a polyamide jacket termite sheath installed.

Terminate the cabling of signal lanterns and multicore cable in each associated terminal assembly.

### Loop Detector Feeder Cables

Cable used shall be as per AS/NZS 2276.2 and shall have a polyamide jacket termite sheath installed.

Install and connect feeder cables from detector loops to detector sensors units located in the controller housing.

Feeder cables to be Telcon - type B3102 CS/NJ/PVC or equivalent.

Feeder cables to be indelibly marked with the loop detector number at each end.

### Loop Cable for Vehicle Detectors

Cable used shall be as per AS/NZS 2276.3

Cable will be V90 HT, 30/0.25.

Supply and install the cable for the loop in a saw cut in the pavement surface.

Clean the saw cut of debris and sharp edges before installing the cable.

Twist loop feeder cable one turn every 200 mm between each loop and junction in the detector pit.

Backfill around the loop cables with polymer modified bituminous emulsion filler.

House cables in conduits where they pass under kerbs.

Refer to CS 1507.

### Power Supply Cable

Supply and Install 2x 1C 25 sq mm Cu XLP/Nj/PVC cable or Power and Water approved equivalent.

PowerWater to approve cable type and connection details

Provide connection of the Power and Water cable to controller.

Provide Notice of Intent to Power and Water for un-metered connection

### Cable Conduit

Terminate the ends of conduits at pits 25 mm ‑ 75 mm inside the pit.

Provide a draw wire in each conduit at completing of wiring.

Provide a residual length of at least one metre of draw wire in junction pits.

Install conduits in accordance with the DUCTING AND CONDUITS Section, with the exception that the copper earth strap to be deleted.

[Ensure the DUCTING AND CONDUITS Section is included]

### Conduit Junction Pit

Provide conduit junction pits and covers to house conduit ends, and 1.5 metres of residual cable for each cable in the pit.

Place conduit junction pits on 100 mm thick coarse gravel bed.

Conduits shall have minimum 100 mm clearance from coarse gravel bed.

Drill neat holes for the entry of cable conduits not greater than 10 mm larger than the outside diameter of the conduit.

Install pits so that lids are level with the adjacent finished surface and backfill in accordance with the DUCTING AND CONDUITS Section.

### Detector Pits

Provide detector pits to house joints in loop detector feeder cable.

Pits to be HR Products Model No. 1420 or similar.

Bed the pits on 75 mm thickness of compacted sand.

Backfill in accordance with the DUCTING AND CONDUITS Section.

### Inspections – Witness Point

**Witness point** - Give 24 hours notice to the Superintendent for inspection of excavations for pedestals, bases and conduits.

## Pedestrian Push Button Assemblies

Pedestrian push button assemblies to be NT Standard LED Type by Aldridge Traffic Systems Pty. Ltd., or a similar product with prior approval by Superintendent.

Refer to CS 1505 and CS 1506.

Install pedestrian push buttons onto pedestal and mast arms as specified.

## Audio‑Tactile Traffic Signal Equipment

### General

Provide equipment additional to the provisions of AS 2353 to generate audio and tactile signals at stations.

Audio-tactile driver to be NT Standard LED Type by Aldridge Traffic Systems Pty. Ltd., or a similar product with prior approval by Superintendent.

## Scats Facilities

### Communications Isolation Pillar

Supply and install pillar including foundation and mounting facilities as specified.

Refer to CS 1504.

Install Zephyr Products model A4 isolation device as compatible with Telstra approval number R82/101.Provided by the Principal.

### Connections Between Controller and Communications Isolation Pillar

Supply and install Class 12 white PVC conduit with 300 mm radius bends and draw wire.

Supply and install Telcon type P3102 CS/NJ/PVC cable or equivalent.

Complete all connections between intersection controller and communications isolation pillar.

### Connection to Telstra Pit – Hold Point

**Connection to Telstra Pit from Communications Isolation Pillar**

Supply and install Class 12 white PVC conduit with 300 mm radius bends and draw wires.

Connection into Telstra point of entry shall be undertaken under Telstra supervision and as per Telstra requirements.

Provision and connection of Telstra cable from Telstra pit to the isolation pillar is the responsibility of Telstra.

**Hold Point -** Provide documentary evidence that the installation is approved by Telstra.

## Documents And Plans – HOLD POINT

**Hold Point -** Submit to the Superintendent one complete set of As Constructed Drawings and completed Cable Layout and Connection Chart before the issue of the Certificate of Practical Completion.

Refer to the **As Constructed Information** clause in MISCELLANEOUS PROVISIONS.

## Checking And Testing – witness point

**Witness Point -** Give 24 hours notice for checking and testing signal controllers, cabling and lanterns.