

PAVEMENT DEPTH FOR VEHICLE AND BICYCLE LOOP DETECTORS

General

A range of traffic control signal and intelligent transport systems have used inductive loop detectors successfully for a number of years. The loop consists of two or three turns of wire in saw slots in the road pavement connected to the sensor units in the controller. Where detector loops are required, they shall be installed in accordance with Specification SI/TCS/8 – *Installation and reconstruction of Traffic Light Signals*.

Guidelines

Pavement condition: Pavement surfaces shall be serviceable, and suitable for saw cutting, as cutting into a dilapidated pavement is likely to lead to premature loop failure / degradation. If the pavement surface is unsuitable, then the pavement must be re-sheeted/reconstructed.

Pavement depth: Pavement shall be at a minimum depth of 100mm to accommodate the sawcuts required for the installation of pavement loops. If the pavement is too shallow in depth, this may result in premature loop failure.

Loop installation: The loops may be sawcut into the pavement or be installed as prefabricated or pre-formed loops after pavement milling but before pavement resheeting.

Vehicle loop depth clearance: Generally the depth of sawcut slot for vehicle detection is specified to be 80mm in depth. This should result in a clearance from the top of road surface to the top of the detector wires of a maximum of 50mm (20mm minimum). RMS specification SI/TCS/8 details the requirements of a vehicle loop as attached in **Appendix A**.

Bicycle loop depth clearance: These loops have different design requirements in terms of depth and number of turns of wire in the saw slots due to the low content of ferrous material within bicycle frames and drive systems. This should result in a clearance from the top of road surface to the top of the detector wires of a maximum of 30mm (15mm minimum). RMS specification SI/TCS/8 details the requirements of a double bicycle loop as attached in **Appendix B**.

Distribution List:

Director, Infrastructure Development; Director, Commercial; Traffic & Safety Management staff; Project and Asset Managers.

For further enquiries

www.rms.nsw.gov.au | E technical_directions_publication@rms.nsw.gov.au

Action

Pavement type: Detector loops should only be installed in either asphalt (not open grade) or concrete pavements but not within flush seals.

Confirm the pavement depth: There is a requirement to confirm that the depth of pavement is not too shallow for the sawcut slot and for the installation for the detector loops. To determine the actual pavement depth and to assist in the deciding on the required pavement treatment (e.g. resheeting) at the location of the proposed loop, either by undertaking a:

- Destructive testing, using a cored sample (max 50mm diameter); or
- Non-destructive testing, using 'Ground penetrating radar' (GPR).

This policy takes effect immediately.

Updates

To ensure that this *Technical Direction* remains current and relevant, minor updates may be made from time to time. This may be done through the Roads & Maritime Services' website using the Traffic & Transport Policies & Guidelines Register which can be found at:

www.rta.nsw.gov.au/trafficinformation/guidelines/documentregister.

The Register should always be checked prior to using this *Technical Direction*.

Approved by:

Authorised by:

SIGNED

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APPENDIX A – VEHICLE LOOP

SECTION A
SLOT FOR LEAD IN
OVERCUT EDGES
DEPTH OF SLOT
SHARP EDGES
BLUNTED (TYP)

SECTION B
NO MORE THAN 16 CABLES/SLOT, OTHERWISE A SECOND CABLE ENTRY IS REQUIRED
FEEDER CABLE (SEE NOTE 3)
150 to 200mm
ROADWAY
REFER NOTE 10
CABLES FROM SAWCUT TO BE LED INTO PVC PIPE
32mm (MIN) HD PVC CONDUIT
SEE NOTE 1
PAVEMENT JUNCTION BOX REFER PLAN VC007-4
TIE CABLE TO ROD

SECTION C
SLOT SEALANT WITH SPEC LSS/2
20mm MIN UNLESS STATED OTHERWISE ON DESIGN PLAN
SURFACE
4mm (NOM) ONLY IN BITUMEN ROADS
ROAD
SEALANT
CABLES TO BE INSTALLED ONE ABOVE THE OTHER AS SHOWN WITH NO MORE THAN ONE CABLE ENTRY INTO (PT) (OR 16 FOR ENTRY INTO PT)
5mm SAWCUT MADE WITH A SINGLE CHISEL-BLADE

SECTION D
CORE HOLE
SAWCUT
LOOP CABLES
STRESS JOINT IN PAVEMENT
BREAK AND ROUND SHARP EDGES
GOOSENECK
REFER NOTE 10
SEE NOTE 9 & 10

NOTES
IF ROAD SHOULDERS ARE UNSEALDED REFER TO SECTION B-9 ON DWG VC005-18

SECTION B-B
1. LOOP DETECTOR CABLE AND FEEDER CABLE SHOULD BE JOINED AND SWEATED IN FOOTPATH PITS. EACH JOINT MUST BE SEPARATELY INSULATED WITH A 6mm PD CAP HEAT SHRINK. (FOR BOND APPROVED) AND SECURED AT JOINTS, APPLY METHOD SHOWN ON DRAWING V4117-4 TO FEEDER CABLE.
2. LOOP CABLE SHALL COMPLY WITH AS 2276 PART 2.
3. LOOP FEEDER CABLE SHALL COMPLY WITH AS 2276 PART 2.
4. ALL LOOPS MAY BE INSTALLED UP TO 5m FROM THE STORES WHEN ROAD PAVEMENT IS CONCRETE. OTHERWISE, THE STORES SHALL BE INSTALLED WITHIN TWO METRES OF THE STORES.
5. LOOP CABLES TO BE LAPPED SHALL BE LAPPED (T) WITH HELICOIL (402-5) OR EQUIVALENT AND NUMBERED AS PER THE TYPICAL INSTALLATION IN FRONT TO REAR, LEFT TO RIGHT IN NUMERICAL ORDER REGARDLESS OF PHASE OR PJ BOX POSITION.
6. ALL FEEDER CABLES TO BE LABELLED (HELICOIL H04-9 OR EQUIVALENT) AT EACH END TO SHOW THE DETECTOR NUMBER AS PER DESIGN PLAN (eg 1, 2, 3 ETC).
7. THE LOOP CABLE SHALL BE CONTINUOUS (ie NO JOINTS PERMITTED) BETWEEN F AND S.
8. ALL LOOP CABLE LEADS SHALL RETURN TO A PJ BOX IN THE FOOTPATH (OR MEDIAN IF A MINIMUM 2 METRES WIDE). THE PAVEMENT JUNCTION PIT IS TO BE INSTALLED NO GREATER THAN 1.0 m FROM THE KERB.
9. DETAIL 'D' SHOWS THE RECOMMENDED METHOD FOR PROTECTING LOOP CABLES CROSSING A-STRESS JOINT.
10. FIT RETAINING WEDGES AT 300 to 400mm SPACING TO ENSURE LOOP CABLE DOES NOT MOVE UPON ROAD SURFACE. THE WEDGE MATERIAL TO BE RESILIENT AND BE IMPERVIOUS TO WATER.
11. THE LOOP FEEDER CABLE TO BE CONTINUOUS (ie NO JOINTS PERMITTED).

TYPICAL CONNECTION & WIRING OF LOOPS
FOR DETAILS OF WIRING RULES AND ALTERNATIVE ENTRY POSITIONS REFER TO DWG VC005-19

TYPICAL INSTALLATION OF STOP LINE DETECTORS
DIMENSIONS IN METRES

DETAILED DIMENSIONS:
L: 1.10
X: 0.7
A: 0.8
B: 1.0
C: 1.4
D: 1.75
E: 1.75
F: 1.0
G: 1.0
H: 1.0
I: 1.0
J: 1.0
K: 1.0
L: 1.0
M: 1.0
N: 1.0
O: 1.0
P: 1.0
Q: 1.0
R: 1.0
S: 1.0
T: 1.0
U: 1.0
V: 1.0
W: 1.0
X: 1.0
Y: 1.0
Z: 1.0

REFERENCE DRAWINGS
DRAWN A DIVON
CHECKED RB
DATE 27-01-85
DESIGNED BMT 27-01-85
APPROVED
F. HILSCHER
DATE 01-10-85

ROADS AND TRAFFIC AUTHORITY NSW
TRAFFIC SIGNALS

METHOD OF INSTALLATION OF STOP LINE DETECTORS

REG NO VC005-17

SHEET NO A2

SCALE 1:1

FILE NO

ISSUE 1/1

ISSUE G

ISSUE H

ISSUE I

ISSUE J

ISSUE K

ISSUE L

ISSUE M

ISSUE N

ISSUE O

ISSUE P

ISSUE Q

ISSUE R

ISSUE S

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ISSUE W

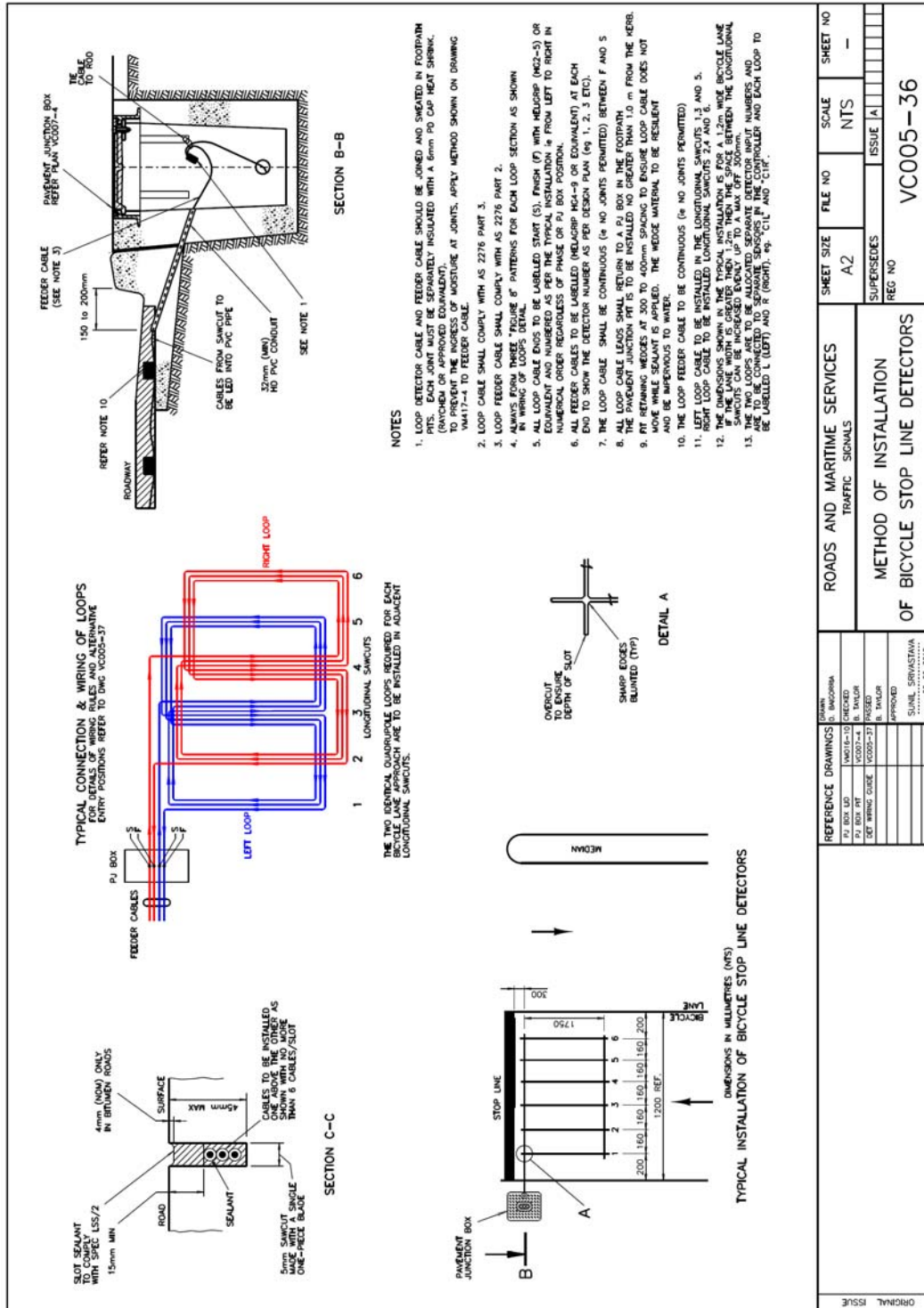
ISSUE X

ISSUE Y

ISSUE Z

Note:
1. The loop details must be shown on the TCS Design Layout and Cable Plan (see Traffic Signal Design – http://www.rta.nsw.gov.au/doingbusinesswithus/downloads/technicalmanuals/trafficsignaldesign_dl1.html).

APPENDIX B: DOUBLE BICYCLE LOOP



Notes:

1. The loop details must be shown on the TCS Design Layout and Cable Plan (see Traffic Signal Design – http://www.rta.nsw.gov.au/doingbusinesswithus/downloads/technicalmanuals/trafficsignaldesign_dl1.html).
2. A Note is required on the Cable Plan to alert the Contractor that a double bicycle loop needs to be installed.