



# Engineering Standard

## Signalling

### CRN SD 008

# SIGNALLING DESIGN PRINCIPLES – BI- DIRECTIONAL SIGNALLING

Version 1.1

Issued April 2016

**Owner: Principal Signal Engineer**

**Approved by: Stewart Rendell**

**Authorised by: James Zeaiter**

Disclaimer. This document was prepared for use on the CRN Network only. John Holland Rail Pty Ltd makes no warranties, express or implied, that compliance with the contents of this document shall be sufficient to ensure safe systems or work or operation. It is the document user's sole responsibility to ensure that the copy of the document it is viewing is the current version of the document as in use by JHR. JHR accepts no liability whatsoever in relation to the use of this document by any party, and JHR excludes any liability which arises in any manner by the use of this document.

Copyright. The information in this document is protected by Copyright and no part of this document may be reproduced, altered, stored or transmitted by any person without the prior consent of JHR.

## Document control

Revision	Date of Approval	Summary of change
3.0	May 2003	RIC Standard SC 00 13 01 08 SP Version 3.0 May 2003
1.0	May 2011	Conversion to CRN Signalling Standard CRN SD 008
1.1	April 2016	Review

## Summary of changes from previous version

Section	Summary of change
	No Changes from V1.0

## Contents

<b>8</b>	<b>Bi-Directional Signalling .....</b>	<b>4</b>
8.1	Bi-Directional Signalling: Principle 8.1 .....	4
8.1.1	Introduction.....	4
8.1.2	Signalling Arrangements .....	4
8.1.3	Signalling Controls .....	4
8.1.4	Maintenance Releases.....	4
8.1.5	Half – Pilot Staff Inscription .....	5
8.1.6	Pilot Staff Lock Designation Plate .....	6

## 8 Bi-Directional Signalling

### 8.1 Bi-Directional Signalling: Principle 8.1

#### 8.1.1 Introduction

This Principle addresses the requirements for the provision and operation of bi-directional signalling over double running line sections.

#### 8.1.2 Signalling Arrangements

Generally the number of signals provided for the reverse direction of running is considerably less than for the normal direction of running.

Care shall be exercised in ensuring that the signals provided for the reverse direction of running are situated so as not to be confused with the signals provided for the normal direction of running, on the adjacent track. Where provided, reverse direction running signals are to be paired with the normal direction running signals on the adjacent track.

#### 8.1.3 Signalling Controls

If a train is signalled into a bi-directional section from one end then the signal controlling the entrance into the section shall lock the signal controlling the entrance into the section at the opposite end and prove that all intermediate automatic signals controlling movements in the opposite direction to which the train is running are at stop.

In addition the signal controlling the entrance into the section for the reverse direction of running shall prove that the maintenance releases are normal.

If a train is in the bi-directional section then its direction of travel shall be detected by the signalling system and constantly monitored at intermediate signals in order to allow a second train running in the same direction as the first train to enter the bi-directional section as soon as the first train has cleared the overlap beyond the first automatic signal in the section.

The signal at the opposite end of the bi-directional section controlling the entrance to the bi-directional section shall not be able to be cleared until all trains in the opposing direction have cleared the bi-directional section. (Opposing shunt signal moves may be permissible up to a train proved at stop at the home signal at the exit to the bidirectional section, where required)

#### 8.1.4 Maintenance Releases

Maintenance releasing switches may be provided where necessary for maintenance staff protection and shall enable maintenance staff to block the reverse direction movements.

The routes controlling the reverse direction movements shall be proved normal and the section proved clear of all trains travelling in the reverse direction before the maintenance release can be operated and the reverse direction block enabled.

Three separate maintenance releasing switches, X, Y & Z may be provided to facilitate up to three independent maintenance crews. The removal of the key from any one of the releasing switches shall disable the reverse direction working on both lines in the double line section.

The location of the releasing switches shall be subject to their on-track accessibility with respect to the maintenance crew requirements.

### 8.1.5 Half – Pilot Staff Inscription

Details are required to be inscribed on half pilot staffs in bi-directional signalled areas similar to the following two examples:

CORRIMAL WG501D	WOLLONGONG 466D	Name of the interlocking and Home/Starting or Starting Signal where half pilot staff located.
DOWN MAIN (To WOLLONGONG)	DOWN MAIN (To CORRIMAL)	
		Bi-directional line concerned
		Name of the interlocking at the opposite end of the bi-directional section
CORRIMAL WG503U	WOLLONGONG 468U	
UP MAIN (To WOLLONGONG)	UP MAIN (To CORRIMAL)	

Half pilot staffs in bi-directional signalled areas are to be further individually identified by being coloured/banded yellow for the normal down direction line and blue for the normal up direction line.

The signal number is the normal Home/Starting Signal for the line concerned and also applies to other Home/Starting or Starting Signal(s) leading onto the bi-directional line concerned.

### 8.1.6 Pilot Staff Lock Designation Plate

Designation plates attached to Pilot Staff Locks are to be inscribed with details similar to the following two examples:

<p><b>HALF PILOT STAFF</b> CORRIMAL WG501D/503U  DOWN MAIN  (To WOLLONGONG WG 466D/468U)</p>	<p>Name of the interlocking and Home Starting or Starting Signal(s) leading into the bi-directional line concerned</p> <p>Bi-directional line concerned</p> <p>Name of the interlocking at the opposite end of the bi-directional section and the opposing Home/Starting or Starting Signal(s) leading into the bi-directional line concerned</p>
<p><b>HALF PILOT STAFF</b> WOLLONGONG WG 466D/468U  DOWN MAIN  (To CORRIMAL WG501D/503U)</p>	<p>Name of the interlocking and Home Starting or Starting Signal(s) leading into the bi-directional line concerned</p> <p>Bi-directional line concerned</p> <p>Name of the interlocking at the opposite end of the bi-directional section and the opposing Home/Starting or Starting Signal(s) leading into the bi-directional line concerned</p>

Pilot Staff Locks in bi-directional signalled areas are to be further individually identified by being coloured yellow for the normal down direction line and blue for the normal up direction line.