VICROADS SPECIFICATION

TCS 066 – B – 2014

Linking Traffic Signals

To

Railway Level Crossings

Revision:	B
Revision Date :	October 2014

Foreword

This specification has been developed by VicRoads. It is one of a number of technical specifications, and associated standard drawings, which set out the requirements for roadside ITS devices, traffic signal equipment and other electrical equipment and associated devices and control systems.

This specification is intended for use in all relevant works undertaken by or on behalf of VicRoads.

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Specification updates. VicRoads specifications and associated standard drawings are subject to periodic review. To keep the specifications up to date, amendments or new editions are issued as necessary. It is therefore important for users of VicRoads specifications to ensure that they have the latest version and associated amendments.

Road Operations
60 Denmark Street Kew 3101

Phone: (03) 9854 2103 Fax: (03) 9854 2319

Revision History

Revision	Date	Prepared by	Approved by
A (original)	Jan 2014	E Lee	S Purtill
B	Oct 2014	E Lee	S Purtill

PREFACE

A. TELECOMMUNICATIONS EQUIPMENT

A.1 All telecommunications equipment shall comply with relevant requirements of the Australian Communications and Media Authority (ACMA). Such equipment shall be labelled with a Regulatory Compliance Mark.

B. CHANGES TO THIS SPECIFICATION

B.1 The main changes to this specification from the previous version are listed below:

- Additional comments from Metro Trains Melbourne (MTM)

The following table details previous revisions to this specification.

Revision Date	Revision Owner	Purpose of Revision
Jan 2014	VicRoads ITS	• Modification of headings and reorganisation of sections for greater consistency with Australian Standard

C REFERENCE DOCUMENTS

- AS 1742.7 (part 7) "Manual of Uniform Traffic Control Devices – Railway Crossings"
- AS 1742.14 (part 14) "Manual of Uniform Traffic Control Devices – Traffic Signal"
- AS/RISSB 7658:2012 "Railway Infrastructure – Railway Level Crossing"

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Contents

SECTION 1 GENERAL

1.1 GENERAL

1.1.1 This document describes the general operational requirements of traffic signal controllers to be linked with boom barriers at railway level crossings in Victoria since 1987.

1.1.2 Electrical interfacing between the traffic signal controller and the rail level crossing controller is provided by a multi-core telephone-type cable having at least 10 pairs. The wiring is detailed in the Standard Rail-Link Cable Termination Chart (Appendix 2).

1.1.3 Pedestrian Operated Signals and intersection traffic signals not immediately adjacent to a rail level crossing but within 100m should be interlinked (based on site specific conditions and requirements) with the standard rail link.

1.1.4 Roundabout metering signals shall have a standard rail link with adjacent rail level crossings. Roundabout metering signals are 2 aspect displays (yellow and red – no green) which operate on a demand basis. When the railway boom barriers are horizontal, the traffic signal display is blank.

1.2 STANDARD RAIL LINK INPUTS

1.2.1 For a standard installation, the following five inputs are generated by the rail level crossing control system and fed into detector inputs in the traffic signal controller:

- CABLE MONITOR
- PRE-RELEASE
- RELEASE/FORCE (R/F)
- CALL
- BOOMS HORIZONTAL

1.2.2 Each of these inputs is generated from a rail level crossing control relay. Each can be in the *on* (*closed)* or *off (open)* state.

1.3 STANDARD RAIL LINK OUTPUTS

1.3.1 The traffic signal controller generates the following two outputs, which are sent to the rail level crossing control through a special signal group:

- TRAFFIC LIGHT RESPONSE (TLR)
- ACKNOWLEDGE CALL (AKN)

1.3.2 The *green* state of the signal group indicates the TLR and the *off* state indicates the AKN.

SECTION 2 ACRONYMS

2.1 The acronyms use in this document shall be interpreted as follows:

AKN	Acknowledge Call
TLR	Traffic Light Response

SECTION 3 BASIC OPERATING PROCEDURE

3.1 GENERAL

3.1.1 The TYPICAL SEQUENCE CHARTS in Appendix 1 shows the sequence of events and the change in state of each input and output.

3.2 CALL

3.2.1 Following the establishment of a CALL input from the rail level crossing control (usually a one second presence is specified), a HOLD timer will be started and limitations imposed on the normal phase sequence. For instance, certain "preferred" phases may be allowed to introduce and extend, while others may be terminated.

3.2.2 By the time the HOLD timer expires, the traffic signal controller should be ready to immediately initiate a "pre-emptive transfer" to the TRAIN sequence. An analysis of the worst-case response should be performed using the CRITICAL RESPONSE ANALYSIS TABLE (Appendix 3).

3.2.3 An example of the conditions which may be imposed following establishment of the CALL may be seen in the Appendix: CALL RESPONSE CONDITIONS – TYPICAL TABLE (Appendix 4).

3.2.1 Pre-emptive transfer from phase green

3.2.1.1 Terminate the running phase (without violating minimum green or pedestrian clearance times) and proceed via the TRACK CLEARANCE phase (if used) to the nominated TRAIN phase.

3.2.2 Pre-emptive transfer from phase intergreen

3.2.2.1 Continue to proceed to the next phase, but do not introduce pedestrian movements, then terminate the phase after minimum green and proceed via the TRACK CLEARANCE phase (if used) to the nominated TRAIN phase.

3.3 TRAIN PHASE SEQUENCE

3.3.1 Track Clearance Phase

3.3.1.1 The TRACK CLEARANCE phase runs before the train activates rail flashing signal operation to allow time for all road vehicles to clear the railway tracks.

3.3.1.2 It may run fixed-time or may be terminated to suit site-specific conditions.

3.3.2 Train Phase

3.3.2.1 The TRAIN phase runs after the TRACK CLEARANCE phase. It services those traffic movements that do not conflict with the railway tracks.

3.3.2.2 It may have sub-phases to allow different movements and/or pedestrian sequences to run. Consideration should be given to:

- minimum greens for groups;
- maximum times for groups; and
- how groups are extended.

3.4 TRAFFIC LIGHT RESPONSE (TLR)

3.4.1 Description

a) The Traffic Light Response (TLR) is an output that is sent from the traffic signal controller back to the railway level crossing control equipment to indicate that the road traffic signals are ready for activation of the boom barriers.

b) Generally, the TLR is not utilised by the rail level crossing control. When the train enters the Holding Section, the Call is sent to the traffic signal controller. When the train enters the Control Section, the boom barriers are activated regardless of whether the TLR has been received or not.

c) However, a special circumstance arises if the train is held on a red signal after entering the Holding Section (or even after it has entered the Control Section). In this case, the rail level crossing control suppresses the Call output. When the train receives a green signal, a Call is initiated so that the traffic signal controller commences the cycle action. The rail level crossing control waits for the TLR input, then commences to activate the boom barriers.

d) The standard minimum Call time shall be 35 seconds. The prescribed (absolute) minimum time shall not be less than 25s.

e) Any special site requirements where the Call times will be less than 35s shall have prior, mutual written agreement by the authorised representative of the Road Authority and Rail Infrastructure Manager. If the TLR input is not received, the boom barriers will be activated after a set period - usually the standard 35 seconds call time.

f) The TLR output issued to the rail level crossing control to indicate arrival at a nominated instant in the TRAIN phase sequence. It is maintained until the PRE-RELEASE input is reinstated.

3.4.2 When the TLR is sent

3.4.2.1 Depending on the circumstances, the TLR output may be sent back to the rail level crossing control at any of the following instants in the Train phase sequence:

a) the start of intergreen prior to the TRACK CLEARANCE phase; or
b) the start of TRACK CLEARANCE phase; or
c) at the end of the TRACK CLEARANCE phase minimum green period; or
d) the start of TRACK CLEARANCE phase intergreen; or
e) the start of the TRAIN phase.

3.4.2.2 Generally, the TLR output should not be provided until traffic has cleared, as it may be used to initiate boom closure or to grant permission for train movements. Determination of the most suitable instant requires care and is determined following site-specific considerations. For example, the end of a "late-start" interval during the TRACK CLEARANCE phase may be useful by providing some scope for fine-tuning.

3.4.3 Signal group aspects

3.4.3.1 The TLR output is generated only during the *green* aspect of the TLR signal group, as indicated in the Typical Sequence Chart (Appendix 1).

3.4.3.2 No conflict is permitted during TRAIN phase. Conflict is defined as concurrent green traffic signals display(s) approaching a rail crossing red flashing signal.

3.4.3.3 Solid yellow traffic signal display is "prepare to stop". It is permissible to have yellow traffic signal displays with a rail crossing red flashing signal display.

3.4.4 Force

3.4.4.1 The FORCE is indicated by the RELEASE/FORCE input going off. This occurs when the train enters the control section causing the red lights at the crossing to flash and bells to ring. Abnormal circumstances may cause the FORCE to be received before the TLR is sent, which results in the traffic signals flashing yellow.

3.4.5 Booms Horizontal

3.4.5.1 Receipt of this input is an indication that all the booms have reached horizontal. This information may be used to terminate the TRACK CLEARANCE phase or to drop red arrows. On receipt of the BOOMS HORIZONTAL input, the MSS8 flag is set and remains set until the BOOMS HORIZONTAL input turns off. Message flag, MSS8 is used to monitor the duration of boom closures.

3.4.6 Pre-Release

3.4.6.1 Normal operation for one train

a) The re-closing of the PRE-RELEASE input is an indication that the train has cleared the control section of track (and also crossing track) and that the booms are about to lift. When it is received, the controller initiates a pre-release sequence which directs the traffic signal controller to terminate all signal groups in the train phase without violating pedestrian or minimum green times.

b) If a pedestrian phase is in walk cycle when the PRE-RELEASE is received, an alternate time setting for the pedestrian walk time is selected, so that normal operation may resume as soon as possible. The traffic signal controller will then proceed to the TRAIN phase all-red interval and remain there pending reclosing of the RELEASE input.

c) The use of the PRE-RELEASE mechanism allows the traffic signals to turn green for traffic crossing the level crossing as soon as the boom barrier reaches 85 degrees vertical and the rail crossing red flashing signals extinguish.

3.4.6.2 Second call during train phase

a) Following receipt of the PRE-RELEASE input and, a second CALL is received prior to the traffic signal controller being in the TRAIN phase intergreen period (i.e. the boom barriers have commenced to rise from the horizontal but the traffic signal controller is still not in the TRAIN phase intergreen), then the TRAIN phase sequence should be recommenced and traffic signals shall remain as red display.

b) This is to ensure that a recognisable cyclic sequence is maintained; that timers are reset; that the TLR group output is appropriate; and that the TRACK CLEARANCE phase is re-run if necessary to clear any vehicles which may have moved forwards when the booms lifted. It also allows any spare time to be usefully employed, for example where there is an unusually long interval between the CALL and the FORCE.

3.4.6.3 Second call during train phase intergreen

a) If a second CALL is received during the TRAIN phase intergreen period then proceed to the subsequent phase (but do not service pedestrians) and then commence a new train phase sequence as in 3.2 above.

3.4.7 Release

3.4.7.1 The release is indicated by the RELEASE/FORCE input going to the *on* state. This input releases the traffic signal controller to resume normal vehicle operation with an appropriate phase, according to site-specific requirements.

SECTION 4 SPECIAL PROCEDURES

4.1 ABNORMAL CONDITIONS

These conditions should not occur in normal operation. However, when they do, appropriate steps should be taken to register the event and to take action as follows.

4.1.1 Abnormal condition 1 – Force before TLR

4.1.1.1 Although 35 seconds at least should elapse between receipt of a CALL input and the FORCE input (termination of the RELEASE/FORCE input), there may be occasions when the FORCE occurs prior to the traffic signal controller issuing the TLR output.

4.1.1.2 This will force a flashing-yellow response and generate ABNORMAL CONDITION message No. 1 via MSS3. When the full RELEASE is received (the RELEASE/FORCE input is reinstated) the traffic signal controller will go through an all-red start-up sequence and resume normal operation.

4.1.2 Abnormal condition 2 – Late Release

4.1.2.1 The RELEASE TIMER commences counting from receipt of the PRE-RELEASE. If the RELEASE/FORCE is not reinstated before expiry of this timer, then the traffic signal controller will generate ABNORMAL CONDITION message No. 2 via MSS4 and go to flashing-yellow.

4.1.2.2 When the RELEASE/FORCE input is reinstated, the traffic signal controller will go through an all-red start-up sequence and resume normal operation.

4.1.3 Abnormal condition 3 - Force without Call

4.1.3.1 If the RELEASE/FORCE input is terminated without a previous CALL input, the traffic signal controller will generate ABNORMAL CONDITION message No. 3 via MSS5 and go to flashing-yellow.

4.1.3.2 When the RELEASE/FORCE input is reinstated the traffic signal controller will go through an all-red start-up sequence and resume normal operation.

4.1.4 Abnormal condition 4 – Break in Cable Monitor

4.1.4.1 If there is a break in the CABLE MONITOR input, the traffic signal controller will generate ABNORMAL CONDITION message No 4 via MSS6 and go to flashing-yellow until the CABLE MONITOR is reinstated.

4.1.4.2 When this input is reinstated the traffic signal controller will go through an all-red start-up sequence and resume normal operation.

4.1.5 Abnormal condition 5 – Booms not Horizontal

4.1.5.1 In situations where the BOOMS HORIZONTAL input is required, then if the BOOMS HORIZONTAL input is not received during the train sequence, the traffic signal controller will generate ABNORMAL CONDITION message No 5 via MSS7.

4.1.5.2 This flag may be set at the start of the first phase following release from the TRAIN phase sequence if this condition occurs, however, this facility should be deleted if the BOOMS HORIZONTAL input is not used.

4.1.6 Abnormal condition 6 - Booms Stuck

4.1.6.1 If the booms are stuck down, a message is generated via MSS8 or MSS9. It is important to carefully select the time to raise this alarm. Generally, it should be the longest closure time that has been monitored, plus one to two minutes tolerance.

4.1.6.2 The timer to raise this alarm can be achieved by two methods:

Method (a): using a timer in the controller and MSS9, or
Method (b): using the VP count routine and MSS8.

4.1.6.3 Method (a) is a neater solution, but sometimes there will be no spare timers in the controller, so method (b) must be used.

4.2 CALL TERMINATION TIMER

4.2.1 When a CALL input terminates (opens) prior to the FORCE (in the presence of the RELEASE/FORCE input), a timer will begin to count down from the time specified in the alternate time setting table. Any further CALL inputs will reset the timer.

4.2.2 Once the FORCE is received (RELEASE/FORCE terminated), the timer is ignored. If the RELEASE/FORCE input is not terminated prior to expiry of the timer, then the traffic signal controller will AUTO-RELEASE from the train phase sequence and resume normal vehicle operation.

4.2.3 The purpose of this facility is to prevent the traffic signal controller from being "locked up" indefinitely by spurious inputs (in the case of automatic train activated track circuits) or by inadvertent or excessively early calls (in the case of manned signal-boxes). Typical time settings may be 30s (automatic) or 70s (manual).

4.3 OPERATING MODES

4.3.1 Isolation conditions

4.3.1.1 When the CALL input is received, the MSS1 flag is set and will instruct the regional computer (via VP routine 30) to force the traffic signal controller into Isolated operation.

4.3.1.2 During this time the MSS1 flag will remain on until the “termination conditions” are met, as dictated by the requirements, if any, for compensation to traffic delayed by the boom closure.

4.3.2 Compensation techniques

4.3.2.1 Once the train is clear of the crossing and the booms have raised to approximately 85 degrees, the RELEASE is indicated by the RELEASE/FORCE input going on. At this point, the traffic signals should start the phase which allows traffic to cross the rail tracks.

4.3.2.2 If Masterlink is resumed at this point, the phase may receive a very short time through to a full cycle time, depending on the Masterlink cycle generator. To guarantee that the phase runs for a reasonable time to clear the traffic that has been waiting, it is recommended that some mechanism is employed to provide compensation.

4.3.2.3 One technique is for the traffic signals to remain in Isolated mode and hold the phase for a fixed time, after which Masterlink is resumed.

4.3.2.4 Another technique is to set the Masterlink cycle generator to a particular value (using the MSS2 flag) before resuming Masterlink. This can be arranged so that a reasonable amount of time is allocated to the phase running immediately after the train phase.

4.3.2.5 If the Masterlink cycle generator is reset, it will directly affect all sites in that sub-system. Furthermore, it will cause cycle length rotation in any other sub-systems in the marriage chain.

4.3.2.6 A combination of both techniques will often be employed.

SECTION 5 MSS FLAGS - SUMMARY OF OPERATIONS

5.1 MSS 1

5.1.1 This flag is used to control when the local controller is forced into Isolated operation and when it reverts back to Masterlink. It is set upon receipt of the CALL and dropped at some point after the RELEASE, depending on the requirements for compensation. (See 4.3.1)

5.2 MSS 2

5.2.1 This flag is used to determine the exact point in the sequence when the Masterlink cycle generator is reset in preparation for picking up co-ordination.

5.2.2 It is set at some convenient point, usually at the start of the TRAIN PHASE green, and then dropped at the start of the TRAIN PHASE intergreen or later. (See 4.3.2) It must be dropped before the MSS1 flag is dropped.

5.3 MSS 3 TO MSS 9

5.3.1 These are described under ABNORMAL CONDITIONS. (See 4.1.1 to 4.1.6)

SECTION 6 VARIATION PARAMETER TABLES

6.1 SEND SITE ISOLATED

VP1 = 5 - test MSS
VP2 = 0 - current slot
VP3 = 1 - MSS flag
VP4 = 30 - send Isolated

6.2 SET CYCLE GENERATOR

VP5 = 5 - test MSS
VP6 = 0 - current slot
VP7 = 2 - MSS flag
VP8 = 20 - reverse condition
VP9 = 53 - set cycle generator
VP10 = - value

6.3 ABNORMAL CONDITION MESSAGE NO 1

A: "DCL xxxx RAIL LINK: FORCE BEFORE TLR
VP11 = 5 - test MSS
VP12 = 0 - current slot
VP13 = 3 - MSS flag
VP14 = 36 - read TC file
VP15 = *A* - true TC data set *A*
VP16 = 0 - no action if false

(xxxx is the traffic signal site number)

6.4 ABNORMAL CONDITION MESSAGE NO 2

B: "DCL xxxx RAIL LINK: LATE RELEASE
VP17 = 5 - test MSS
VP18 = 0 - current slot
VP19 = 4 - MSS flag
VP20 = 36 - read TC file
VP21 = *B* - true TC data set *B*
VP22 = 0 - no action if false

6.5 ABNORMAL CONDITION MESSAGE NO 3

C: "DCL xxxx RAIL LINK: FORCE WITHOUT CALL
VP23 = 5 - test MSS
VP24 = 0 - current slot
VP25 = 5 - MSS flag
VP26 = 36 - read TC file
VP27 = *C* - true TC data set *C*

VP28 = 0 - no action if false

6.6 ABNORMAL CONDITION MESSAGE NO 4

D: "DNC xxxx RAIL LINK: BREAK IN CABLE MONITOR
VP29 = 5 - test MSS
VP30 = 0 - current slot
VP31 = 6 - MSS flag
VP32 = 36 - read TC file
VP33 = *D* - true TC data set *D*
VP34 = 0 - no action if false

6.7 ABNORMAL CONDITION MESSAGE NO 5

(Required only if the BOOMS HORIZONTAL INPUT is used)

E: "DCL xxxx BOOMS NOT HORIZONTAL
VP35 = 5 - test MSS
VP36 = 0 - current slot
VP37 = 7 - MSS flag
VP38 = 36 - read TC file
VP39 = *E* - true TC data set *E*
VP40 = 0 - no action if false

6.8 MONITOR DURATION OF BOOM CLOSURES

These VPs are not essential; they are only for monitoring purposes.
F: ASIL xxxx BOOMS DOWN
G: ASIL xxxx BOOMS UP
VP41 = 5 - test MSS
VP42 = 0 - current slot
VP43 = 8 - MSS flag 8
VP44 = 36 - read TC file
VP45 = *F* - true TC data set *F*
VP46 = *G* - false TC data set *G*

6.9 ABNORMAL CONDITION MESSAGE NO 6

H: ADNC xxxx BOOMS STUCK MORE THAN *m* MINUTES
I: ADNC xxxx BOOMS LIFTED

Method (a)

VP47 = 5 - test MSS
VP48 = 0 - current slot
VP49 = 9 - MSS flag 9
VP50 = 36 - read TC file
VP51 = *H* - true TC data set *H*
VP52 = *I* - false TC data set *I*

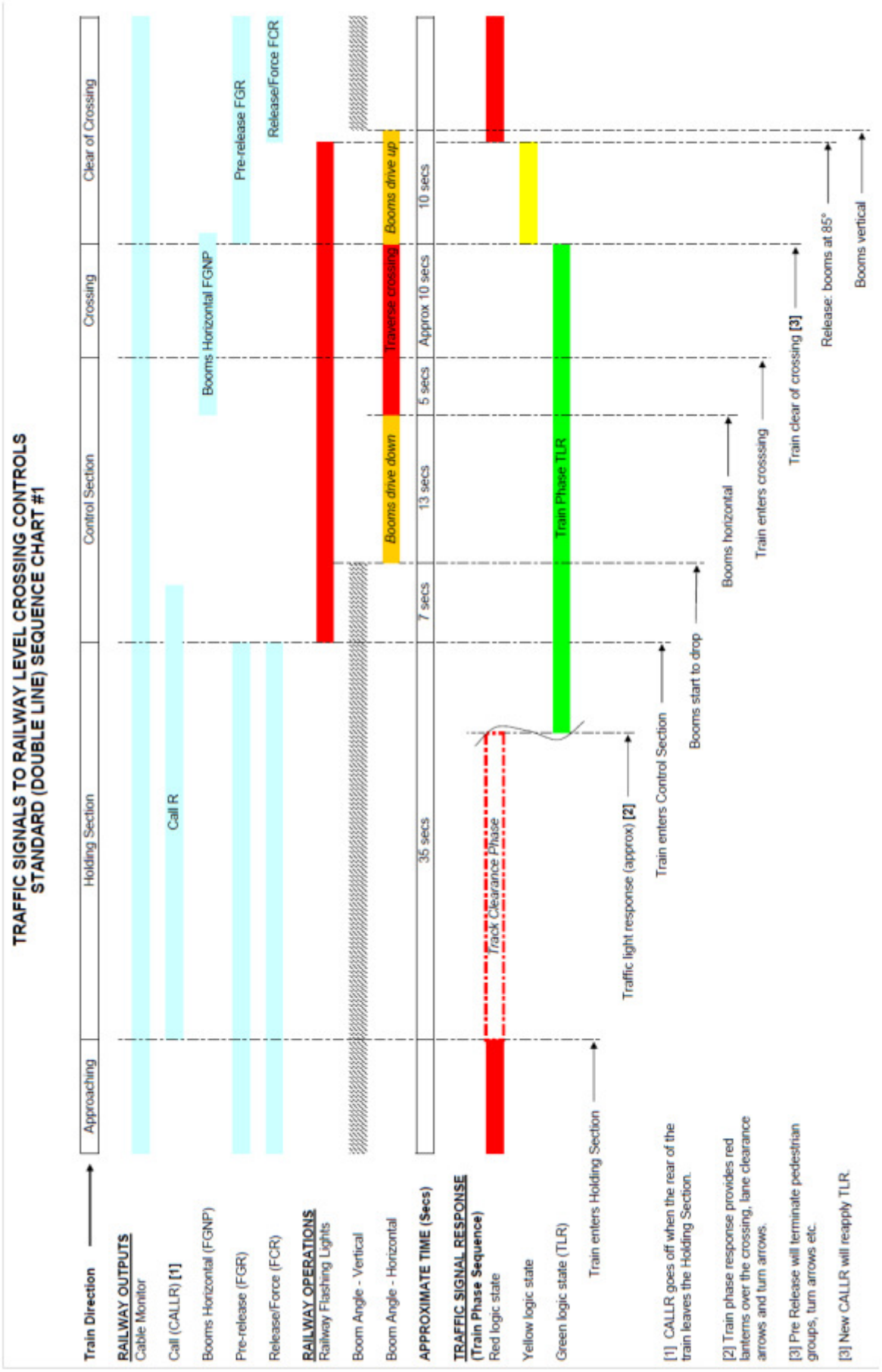
Method (b)

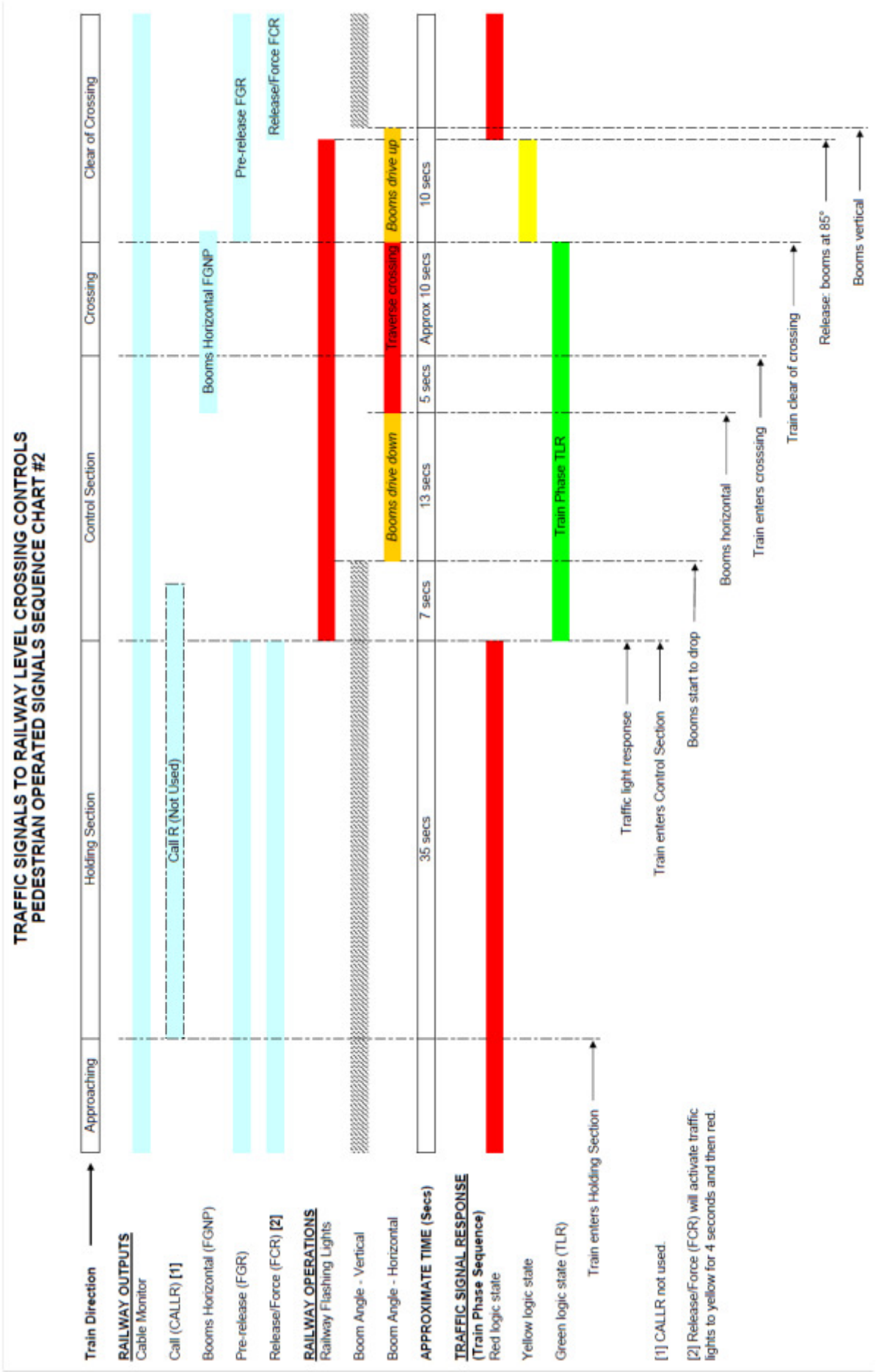
m minutes is VP51 plus VP56 converted from seconds to minutes.

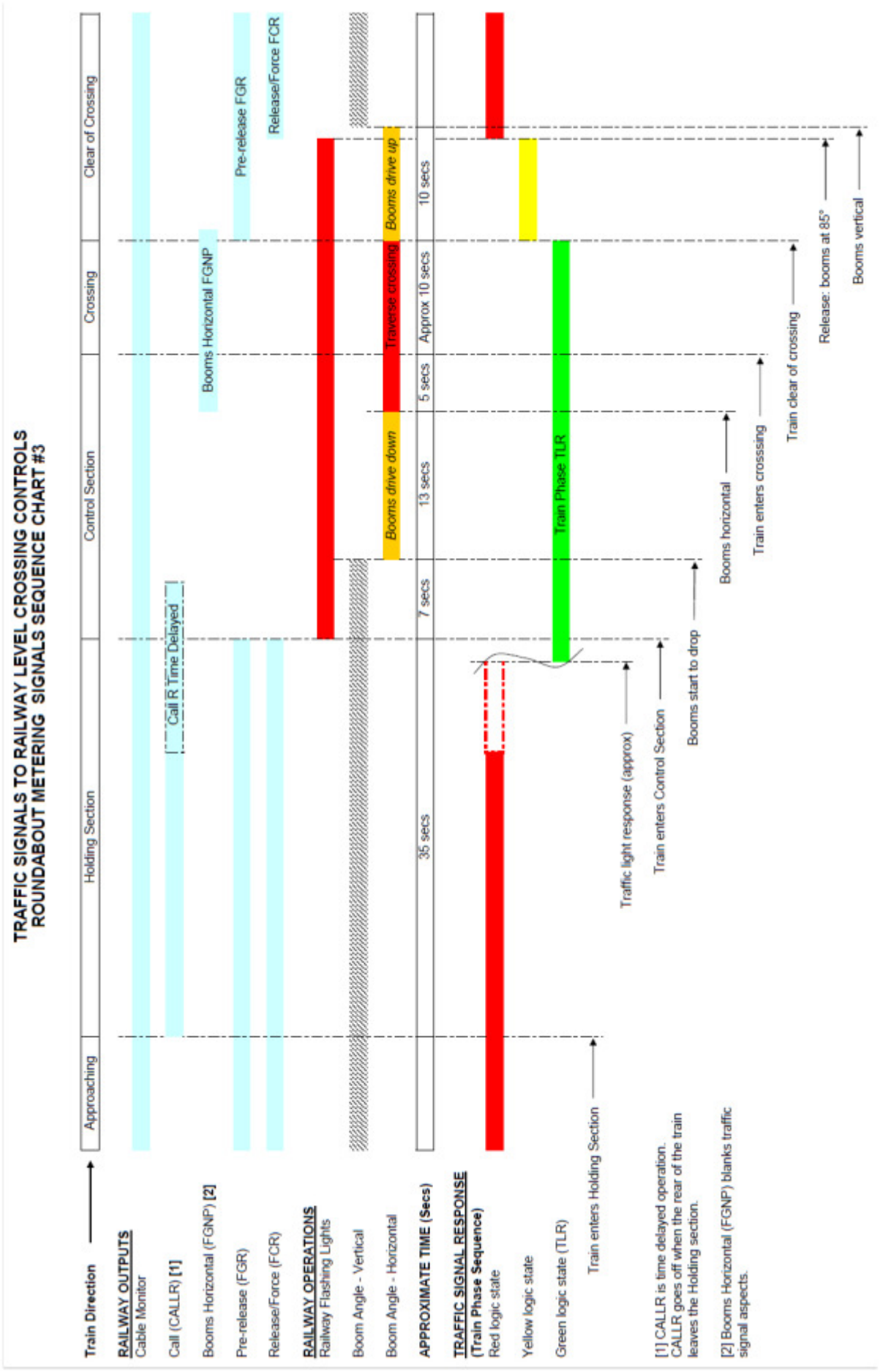
For example, if it is desired to test for the booms down for more than 5 minutes, x would be 255 and y would be 45. (255 + 45)/60 = 5.0 minutes.

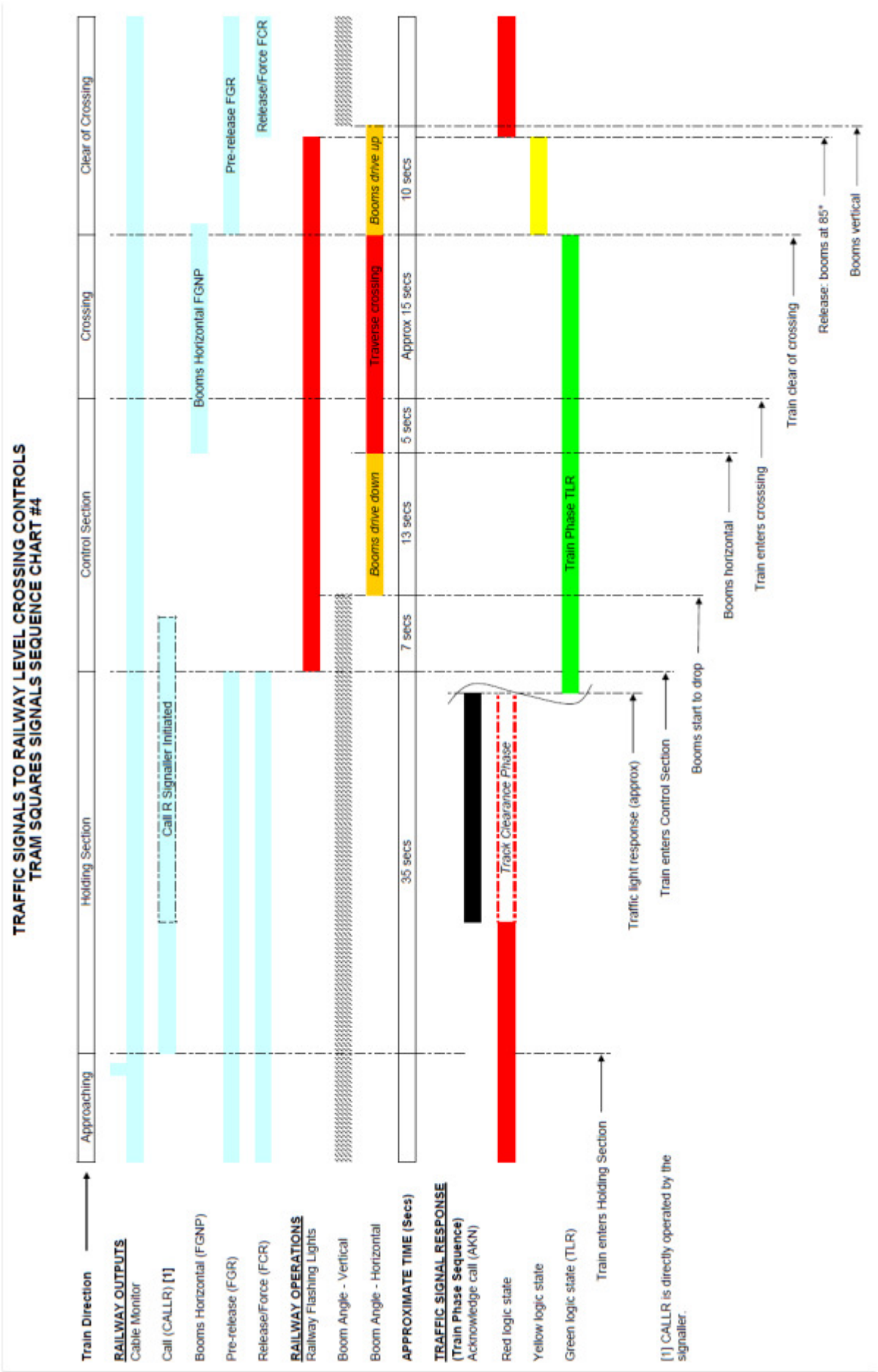
VP47 = 5 - test MSS
VP48 = 0 - current slot
VP49 = 8 - MSS flag 8
VP50 = 15 - count
VP51 = x - for x seconds (up to 255)
VP52 = 192 - hold true until test false
VP53 = 0 - SCATS current count
VP54 = 0 - SCATS flags
VP55 = 15 - count
VP56 = y - for y seconds (up to 255)
VP57 = 192 - hold true until test false
VP58 = 0 - SCATS current count
VP59 = 0 - SCATS flags
VP60 = 36 - read TC
VP61 = *H* - true TC data set *H*
VP62 = *I* - false TC data set *I*

APPENDIX 1 TYPICAL SEQUENCE CHARTS









APPENDIX 2 STANDARD RAIL LINK CABLE TERMINATION CHART

STANDARD RAIL LINK CABLE TERMINATION CHART FOR CONTROLLERS WITH RELAY OR SOLID-STATE LOAD-SWITCHING

SITE: NUMBER:_____

MUNICIPALITY: DESIGNER: DATE:_____

**** Delete the inputs and or outputs on this page which are not used.***

RAIL-LINK DESCRIPTOR or FUNCTION	NO-TRAIN CIRCUIT STATUS	PAIR REF. No.	CONDUCTOR INSULATION COLOUR	TERMINATION DETAILS
CABLE MONITOR (CONTINUITY)	CLOSED	1st	WHITE --------- BLUE ----------	DET. RETURN DETECTOR NUMBER: _____
PRE-RELEASE (FGR)	CLOSED	2nd	WHITE --------- ORANGE ------	DET. RETURN DETECTOR NUMBER: _____
RELEASE/FORCE (R/F or FCR)	CLOSED	3rd	WHITE --------- GREEN ---------	DET. RETURN DETECTOR NUMBER: _____
CALL	OPEN	4th	WHITE --------- BROWN --------	DET. RETURN DETECTOR NUMBER: _____
BOOMS HORIZONTAL	OPEN	5th	WHITE --------- GREY ----------	DET. RETURN DETECTOR NUMBER: _____
SPARE	OPEN	6th	RED ---------- BLUE ----------	NOT TERMINATED NOT TERMINATED
SPARE	OPEN	7th	RED ---------- ORANGE ------	NOT TERMINATED NOT TERMINATED
SIGNALS OFF (FY or BO) RLY	OPEN	8th	RED GREEN	(NC) "FLASH"
ACKNOWLEDGE CALL (AKN)	OPEN	9th	RED BROWN	(NO) "A" RLY (NC) "B" RLY
TRAFFIC LIGHT RESPONSE (TLR)	OPEN	10th	RED GREY	(NO) "A" RLY (NO) "B" RLY

- "TLR" (and "AKN" outputs are driven by SIGNAL GROUP NUMBER:_____ using the "RED", "OFF", "GRN" and "YEL" logic states as shown in the TYPICAL SEQUENCE CHART.
- The (AKN) output may be required occasionally (for manual operation at signal-box sites) thus requiring installation of the "RED" and "YEL" 240 V relays in addition to the "GRN" 240 V relay.

APPENDIX 3 CRITICAL RESPONSE ANALYSIS – TYPICAL TABLE

CRITICAL RESPONSE ANALYSIS
TYPICAL TABLE FOR CALCULATION OF WORST CASE RESPONSE TO PRE-EMPTIVE PHASE TRANSITIONS

CASE 1: CALL RECEIVED IMMEDIATELY FOLLOWING PHASE TERMINATION

Complete one column for each allowable phase transition.

From phase:										
CALL PRESENCE	1	1	1	1	1	1	1	1	1	1
ECO										
YELLOW										
ALL RED										
To phase:										
LATE START										
MIN GREEN										
I#1 ECO										
I#2 YELLOW										
I#3 ALL RED										
To track clearance phase:										
I#4 LATE START										
I#5 MIN GREEN										
I#6 ECO										
I#7 YELLOW										
I#8 ALL RED										
I#9 **To train phase:**										
TOTALS =										

Note: The TLR is usually specified in the range I#1 to I#9 above. eg I#4... TLR signal group green issued at commencement of LS interval.

CONCLUSIONS:

CRITICAL RESPONSE ANALYSIS
TYPICAL TABLE FOR CALCULATION OF WORST CASE RESPONSE TO PRE-EMPTIVE PHASE TRANSITIONS

CASE 2: CALL RECEIVED IMMEDIATELY AFTER WALK INTRODUCTION

Complete one column for each allowable phase transition.

From phase:										
CALL PRESENCE	1	1	1	1	1	1	1	1	1	1
LATE START										
WALK (Short)										
CLEARANCE										
I#1 ECO										
I#2 YELLOW										
I#3 ALL RED										
To track clearance phase:										
I#4 LATE START										
I#5 MIN GREEN										
I#6 ECO										
I#7 YELLOW										
I#8 ALL RED										
I#9 **To train phase:**										
TOTALS =										

CONCLUSIONS:

APPENDIX 4 CALL RESPONSE CONDITIONS – TYPICAL TABLE

CALL RESPONSE CONDITIONS - TYPICAL TABLE

REQUIRED OPTIONS FOR EACH PHASE

PHASE RUNNING: (OR PHASE NEXT IF IN I/G)	A	B	C	D	E	F	G
CLEAR DEMANDS							
TERMINATE IF IN EXTENSION							
HOLD							
SUBSTITUTE WALK TIMES							
CLEAR PED DEMAND IF THIS PHASE NEXT							

ADDITIONAL CONDITIONS: