

| | | | |
|--------|---|--------------|-------------|
| | | ACTION | DATE |
| TO | 1. SENIOR ENGINEER, CONTROLLER APPLICATIONS 2. DAMIEN KALUARACHCHI, OPERATIONS | | |
| FROM | DARREN MCMORRAN | DATE | 3/05/18 |
| SITE | GOULBURN VALLEY HIGHWAY NR PRENTICE ST | SITE NO. | 6048 |
| REGION | NORTH EASTERN | MUNICIPALITY | STRATHBOGIE |

GENERAL

| | | | |
|--------------------|--------|--------------------|----------|
| Works Program Job? | Yes | Project Number | 44IWMAIN |
| Classification | SIMPLE | Works Order Number | 4A005937 |

EXISTING CONTROLLER DETAILS

| | | | | | |
|------|----------|----------------------------|--------|----------|----|
| Type | PSC 2003 | Software Version & Release | V4 R18 | Lanterns | QH |
|------|----------|----------------------------|--------|----------|----|

CONTROLLER APPLICATIONS

| | |
|---------------------------------------|-------------|
| Target Date for Draft Opsheet | ASAP |
| Target Date for completion of Program | ASAP |
| Prepare Interlocking | |
| Update Graphics, Site Notes | No |
| Description of changes | LED Upgrade |

PERSONALITY CHECKSUMS

| | | |
|------------|---------|-------|
| | Hex | Octal |
| Total | C9 | 311 |
| Times | 9 | 11 |
| Pers | C0 | 300 |
| Dispatched | 8/06/18 | |

OPERATIONS - SIGNAL INSTALLATION

| | | |
|-------------------------------------|---|--|
| <input checked="" type="checkbox"/> | Changes to signal hardware | Changes to interlocking |
| <input type="checkbox"/> | Additional detectors | Changes to existing detector numbering |
| <input checked="" type="checkbox"/> | Upgrade controller software to | V5 R82 |
| <input type="checkbox"/> | Other changes | |
| <input checked="" type="checkbox"/> | Place new operation specification in controller | |

PRIOR NOTICE

A job must be entered into RAI Action database before this PROM change will be allowed.

| | | |
|--------------------------|--|-----|
| <input type="checkbox"/> | SCATS data changes - notify | Ext |
| | OR | Ext |
| | before 3:00pm on the day before switch on. | |

SCATS Data Changes -

TRAFFIC MANAGEMENT CENTRE

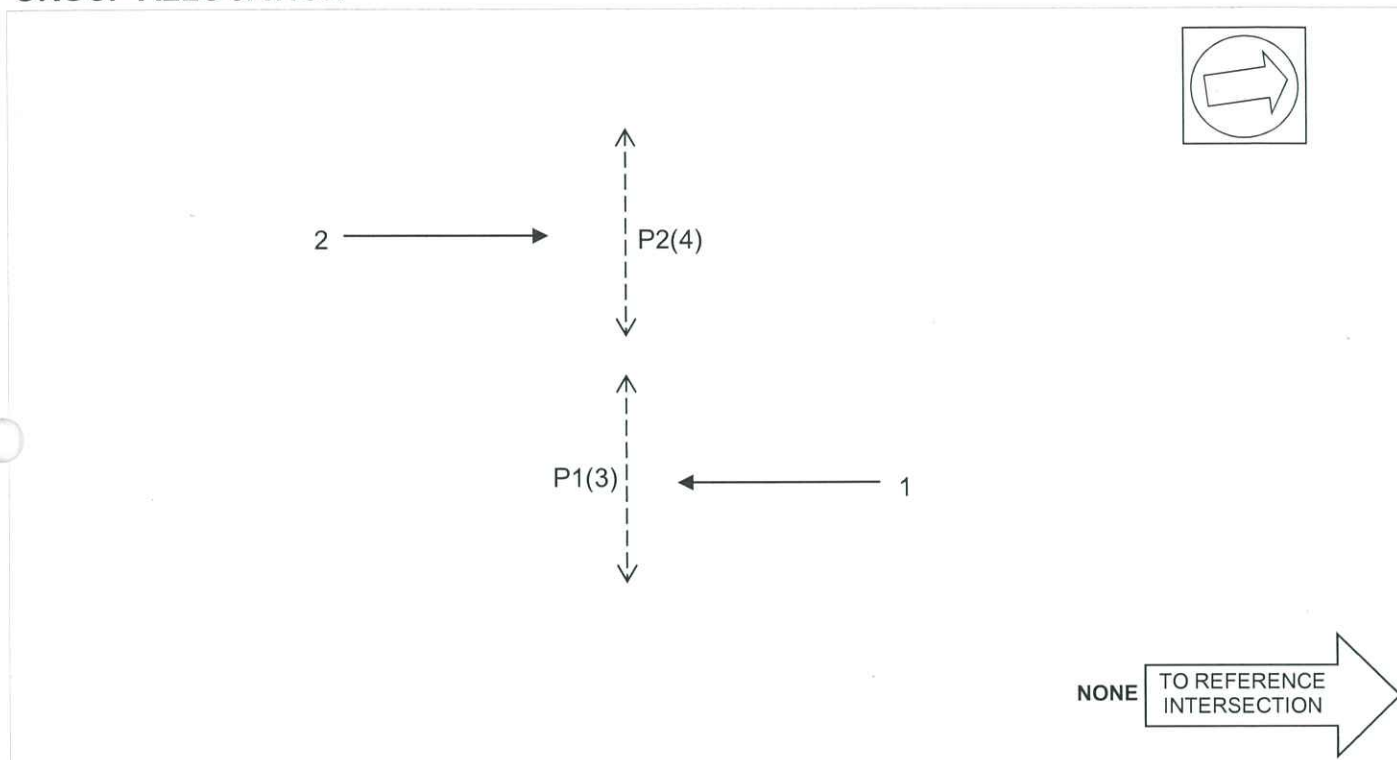
| | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Checksum update only |
| <input type="checkbox"/> | Changes to trim or manual intervention features required |
| <input checked="" type="checkbox"/> | Please notify DARREN MCMORRAN (x8721) on job completion. |

DATE PROM INSTALLED

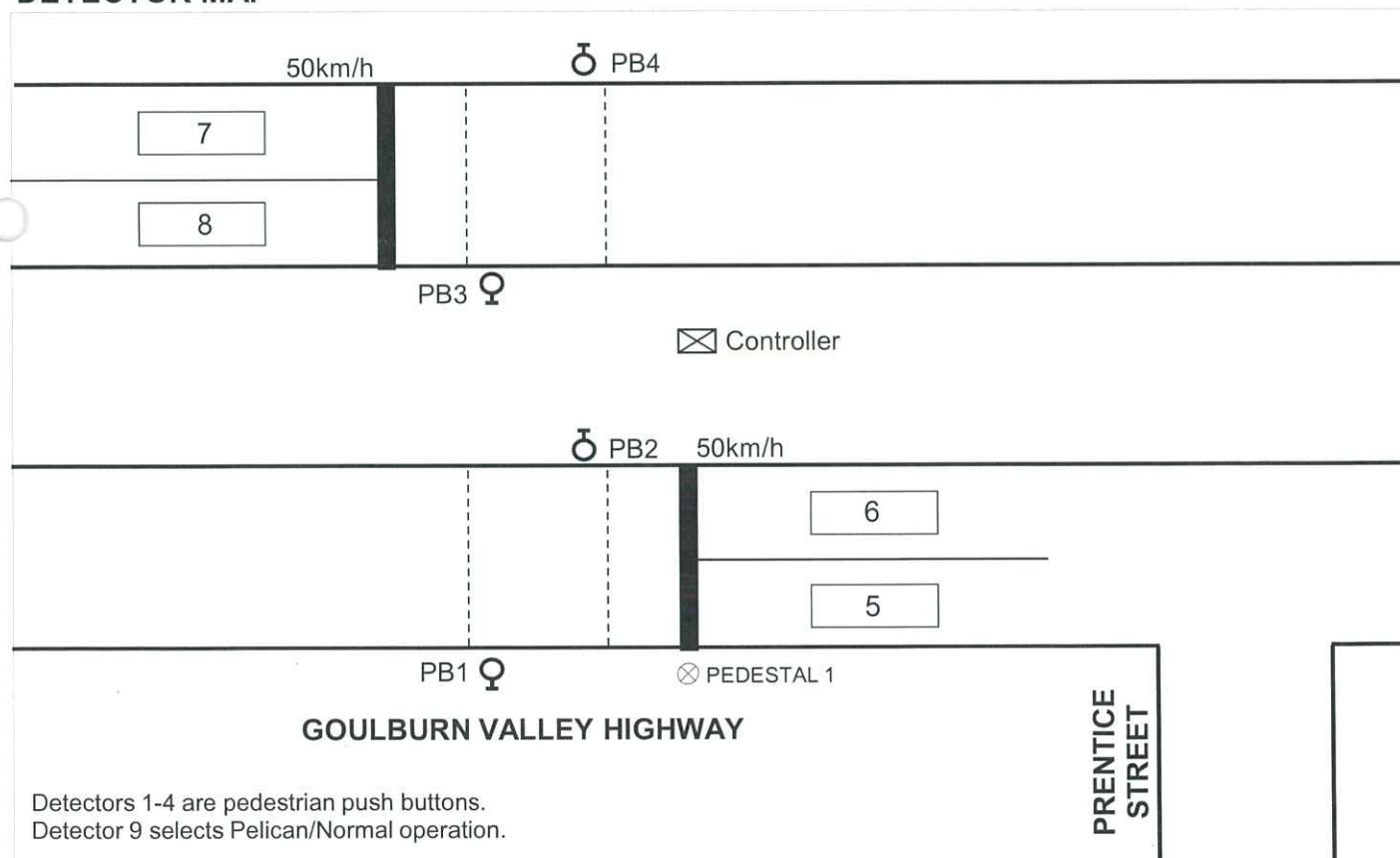
CONTROLLER OPERATION SPECIFICATION

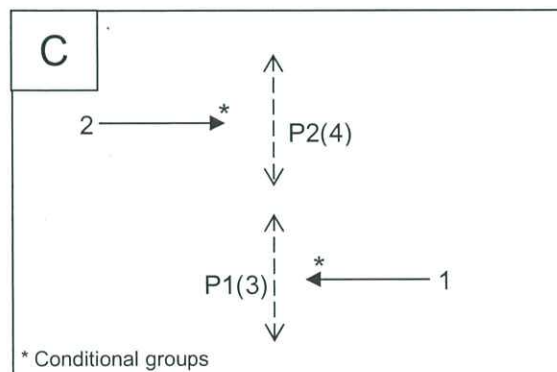
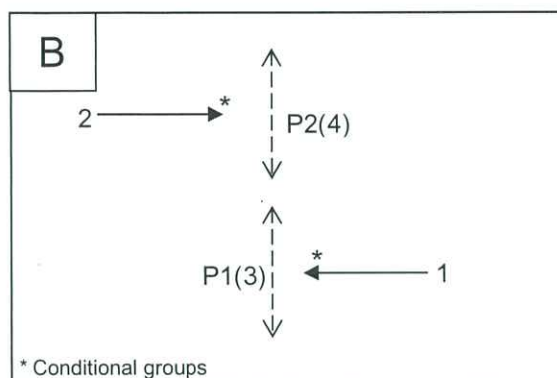
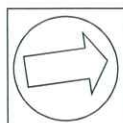
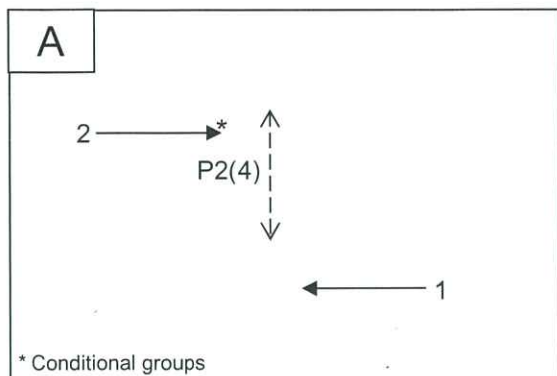
| | | | | |
|-----------------|---|----------------|--|----------------------|
| SITE NAME | GOULBURN VALLEY HIGHWAY NR PRENTICE ST | | SITE NO. | 6048 |
| MUNICIPALITY | STRATHBOGIE | DESIGNED BY | DARREN MCMORRAN | DATE 27/04/18 |
| PLAN NO. | 470969 | DESIGN CHECKED |  | DATE 3/5/18 |
| CONTROLLER TYPE | PSC 2003 | PROM CHECKED |  | DATE 1/6/18 |

GROUP ALLOCATION



DETECTOR MAP



PHASING DIAGRAM

3 m @ 50 km/h = 0.22 secs x 2 = 1 secs

**PEDESTRIAN CONTROL IN
V.A. AND FLEXI ISOLATED MODES**

Controller only runs AØ. P1 can introduce in AØ if SG1 is in extension (i.e. Minimum green has expired) and SG1 gaps or wastes. P2 can introduce in AØ if SG2 is in extension and SG2 gaps or wastes.

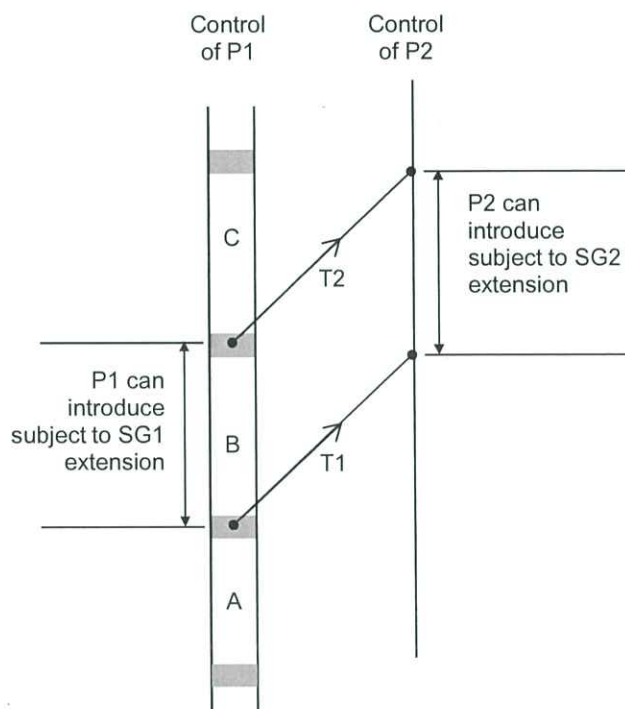
PEDESTRIAN CONTROL IN LINK MODE**PED 1 CONTROL**

- * P1 cannot introduce in AØ #####
- * P1 can introduce at any time in BØ provided SG1 is in extension (i.e. Minimum green has expired) and SG1 gaps or wastes.
- * P1 can introduce at the start of CØ provided SG1 is in extension (SG1 closes down at the start of BØ yellow).
- * Any ped demand placed during BØ intergreen or during CØ will not be serviced until the next cycle

PED 2 CONTROL

The introduction of P2 is governed by delay timers T1 and T2.

- * T1 starts timing at beginning of BØ min. green
- * T2 starts timing at beginning of BØ yellow.
- * P2 can introduce at any time during the period from when T1 expires until T2 expires, provided SG2 is in extension and SG2 gaps or wastes.
- * P2 can introduce when T2 expires provided SG2 is in extension (SG2 closes down at the instant T2 expires).

**NOTES:**

1. Signal groups are independent of phasing.
2. All phases have a permanent demand in Masterlink and Flexilink
3. The values of timers T1 and T2 are normally set at twice the travel time to the reference intersection.
4. When XSF3 (Master & Flexi) is set, P1 and P2 use Special Purpose Timesetting nos. 26 and 27 respectively for their walk time.

V.A. SEQUENCE A

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DETECTOR FUNCTIONS

| DETECTOR No. | Internal / External | Input number | SPECIAL FUNCTION | DETECTOR ALARMS | | | | | |
|--------------|---------------------|--------------|------------------------------------|-----------------|---------|----------------|------------------|-----------|--------|
| | | | | DA Category | Disable | DA on S/C only | Fault Simulation | | |
| | | | | | | | Call & Extend | Call Only | Ignore |
| 1 | E PB | 1 | Call P1** PB3 | 6 | | ✓ | | | |
| 2 | E PB | 2 | Call P1** PB1 | 6 | | ✓ | | | |
| 3 | E PB | 3 | Call P2† PB2 | 6 | | ✓ | | | |
| 4 | E PB | 4 | Call P2† PB4 | 6 | | ✓ | | | |
| 5 | I | 1 | Extend SG1, Approach 1 * | 0 | | | ✓ | | |
| 6 | I | 2 | Extend SG1, Approach 1 * | 0 | | | ✓ | | |
| 7 | I | 3 | Extend SG2, Approach 2 * | 0 | | | ✓ | | |
| 8 | I | 4 | Extend SG2, Approach 2 * | 0 | | | ✓ | | |
| 9 | E | 5 | Off - Pelican POS; On - Normal POS | 1 | ✓ | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |

* For Queuing Feature, refer notes on page 6.

** MSS11 is set for the duration of P1 demand.

† MSS12 is set for the duration of P2 demand.

INTERGREEN AND PEDESTRIAN TIMES

INTERGREEN TIMES

| | LEGAL SPEED | DESIGN SPEED | | INTERGREEN | | |
|-----|-------------|--------------|-----|------------|-----|-------|
| | | YELLOW | RED | YELLOW | RED | TOTAL |
| SG1 | 50 | 50 | - | 3.5 | 2.0 | 5.5 |
| SG2 | 50 | 50 | - | 3.5 | 2.0 | 5.5 |

PEDESTRIAN TIMES

| | WALK | | | CLEARANCE | | | MINIMUM SOLID DON'T WALK |
|----|-----------------|-------|---------|-----------------|-------|---------|-----------------------------------|
| | DISTANCE (m) | TIME | | DISTANCE (m) | TIME | | |
| | | GRAPH | ADOPTED | | GRAPH | ADOPTED | |
| P1 | 8.5 | 8 | 8 | 8.5 | 6 | 6 | 3.0 |
| P2 | 8.5 | 8 | 8 | 8.5 | 6 | 6 | 3.0 |

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PEDESTRIAN OPERATION PELICAN OPERATION

OPERATION OF SG1 & SG2 WHEN CROSSING IS OPERATING AS A PELICAN POS

SG1 closes down to introduce P1 according to the notes on pages 2 and 4 of this Operation Specification. When it closes down it uses the yellow and all red times as described in note 2 on page 4.

SG2 closes down to introduce P2 according to the notes on pages 2 and 4 of this Operation Specification. When it closes down it uses the yellow and all red times as described in note 2 on page 4.

SG1 remains red during SG1 all red, P1 walk and P1 clearance 1.

SG2 remains red during SG2 all red, P2 walk and P2 clearance 1.

At the start of P1 clearance 2, SG1 goes to flashing yellow mode.

At the start of P2 clearance 2, SG2 goes to flashing yellow mode.

SG1 remains in flashing yellow mode during P1 clearance 2 and P1 solid DON'T WALK

SG2 remains in flashing yellow mode during P2 clearance 2 and P2 solid DON'T WALK

SG1 goes green at the end of P1 solid DON'T WALK

SG2 goes green at the end of P2 solid DON'T WALK

The flash rate of SG1 & SG2 when in flashing yellow mode is as follows:

- SG1 & SG2 yellow is on for 0.5 seconds
- SG1 & SG2 yellow is off for 0.5 seconds

OPERATION OF SG1 & SG2 WHEN CROSSING IS OPERATING AS A NORMAL POS

When the POS detector is on, the operation of the crossing changes to that of a normal pedestrian crossing and SG1 & SG2 operate as described below.

SG1 closes down to introduce P1 according to the notes on pages 2 and 4 of this Operation Specification. When it closes down it uses the yellow and all red times as described in note 2 on page 4.

SG2 closes down to introduce P2 according to the notes on pages 2 and 4 of this Operation Specification. When it closes down it uses the yellow and all red times as described in note 2 on page 4.

SG1 remains red during SG1 all red, P1 walk, P1 clearance 1, P1 clearance 2 and P1 solid DON'T WALK

SG2 remains red during SG2 all red, P2 walk, P2 clearance 1, P2 clearance 2 and P2 solid DON'T WALK

SG1 goes green at the end of P1 solid DON'T WALK.

SG2 goes green at the end of P2 solid DON'T WALK.

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CONTROLLER TIMESETTINGS - 1**PHASE TIMESETTINGS**

Front Panel Command: Phase No.Timesetting No (e.g. 1.6 accesses A phase maximum extension green)

| DESCRIPTION | Timesetting No | PHASE | | | | | | |
|-----------------------------|----------------|-------|-------|-------|-------|-------|-------|-------|
| | | A (1) | B (2) | C (3) | D (4) | E (5) | F (6) | G (7) |
| RED / YELLOW | 1 | - | - | - | | | | |
| LATE START | 2 | - | - | - | | | | |
| MINIMUM GREEN (1) | 3 | 3.0 | 0.0 | 3.0 | | | | |
| INCREMENT | 4 | - | - | - | | | | |
| MAXIMUM INITIAL GREEN | 5 | - | - | - | | | | |
| MAXIMUM EXTENSION GREEN (4) | 6 | 40 | - | - | | | | |
| EARLY CUT OFF | 7 | - | - | - | | | | |
| YELLOW (2) | 8 | 3.5 | 3.5 | 3.5 | | | | |
| ALL RED (2) | 9 | 0.0 | 2.0 | 0.0 | | | | |
| SPECIAL ALL RED | 10 | - | - | - | | | | |
| GAP 1 (3) | 11 | 2.5 | - | - | | | | |
| GAP 2 (3) | 12 | 2.5 | - | - | | | | |
| GAP 3 | 13 | - | - | - | | | | |
| GAP 4 | 14 | - | - | - | | | | |
| HEADWAY 1 | 15 | 0.6 | - | - | | | | |
| HEADWAY 2 | 16 | 0.6 | - | - | | | | |
| HEADWAY 3 | 17 | - | - | - | | | | |
| HEADWAY 4 | 18 | - | - | - | | | | |
| WASTE 1 | 19 | 7 | - | - | | | | |
| WASTE 2 | 20 | 7 | - | - | | | | |
| WASTE 3 | 21 | - | - | - | | | | |
| WASTE 4 | 22 | - | - | - | | | | |

- For SG1 and SG2 minimum green in VA mode, refer Special Purpose Timesetting 17 & 21.
For SG1 and SG2 minimum green in link mode, refer Special Purpose Timesetting 20 & 22.
- SG1 can close down during BØ, SG2 can close down during AØ, BØ or CØ
SG1 and SG2 use the yellow time of the phase they close down in, but use the all red times specified in Special Movement Timesettings 1 & 2.
- SG1 and SG2 use the gap, headway and waste times specified in AØ timesettings.
- AØ maximum extension green is used only in VA mode.

PEDESTRIAN TIMESETTINGS

Front Panel Command: Pedestrian No.Timesetting No (e.g. 18.2 accesses P2 walk)

| DESCRIPTION | Timesetting No | PEDESTRIAN | | | | | | | |
|-------------|----------------|------------|---------|---------|---------|---------|---------|---------|---------|
| | | P1 (17) | P2 (18) | P3 (19) | P4 (20) | P5 (21) | P6 (22) | P7 (23) | P8 (24) |
| DELAY | 1 | - | - | | | | | | |
| WALK* | 2 | 8 | 8 | | | | | | |
| CLEARANCE 1 | 3 | 3 | 3 | | | | | | |
| CLEARANCE 2 | 4 | 3 | 3 | | | | | | |

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CONTROLLER TIMESETTINGS - 2**SPECIAL MOVEMENT TIMESETTINGS**

Front Panel Command: B.Timesetting No (e.g. B.5 accesses Special Movement Timesetting No 5)

| Timesetting No | Timesetting (Range: 0-5) | FUNCTION |
|----------------|--------------------------|-------------------------------------|
| 1 | 2.0 | SG1 ALL RED (SUBSTITUTE BØ ALL RED) |
| 2 | 2.0 | SG2 ALL RED (SUBSTITUTE BØ ALL RED) |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |

SPECIAL PURPOSE TIMESETTINGS

Front Panel Command: B.Timesetting No (e.g. B.19 accesses Special Movement Timesetting No 19)

| Timesetting No | Timesetting (Range: 0-200) | FUNCTION | |
|----------------|----------------------------|--|------------------------------|
| 9 | 0 | OFFSET T1 | LOW OFF PEAK No Z-, No Z+ |
| 10 | 0 | OFFSET T2 | |
| 11 | 0 | OFFSET T1 | |
| 12 | 0 | OFFSET T2 | AM PEAK Z-, No Z+ |
| 13 | 0 | OFFSET T1 | PM PEAK No Z-, Z+ |
| 14 | 0 | OFFSET T2 | |
| 15 | 0 | OFFSET T1 | |
| 16 | 0 | OFFSET T2 | HIGH OFF PEAK Z-, Z+ |
| 17 | 10 | SG1 ISOLATED MIN GREEN | |
| 18 | 0 | LIMIT GREEN WATCHDOG TIMER | VC >= 4 ONLY |
| 19 | 0 | SPECIAL FACILITY CONTROLS ALARM TIMER | |
| 20 | 10 | SG1 LINK MIN GREEN | |
| 21 | 10 | SG2 ISOLATED MIN GREEN | |
| 22 | 10 | SG2 LINK MIN GREEN | |
| 23 | | | |
| 24 | | | |
| 25 | 25 | DELAY TIMER FOR APPROACH 2 QUEUING FEATURE | |
| 26 | 8 | P1 WALK TIME SUBSTITUTION | |
| 27 | 8 | P2 WALK TIME SUBSTITUTION | |
| 28 | | | |
| 29 | | | |
| 30 | | | |
| 31 | | | |
| 32 | | | |
| 33 | | | |
| 34 | | | |
| 35 | | | |
| 36 | | | |
| 37 | | | |
| 38 | | | |
| 39 | | | |
| 40 | | | |

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CONTROLLER TIMESETTINGS - 3**PRESENCE TIMESETTINGS**

Front Panel Command: D.Detector No (e.g. D.7 accesses Presence time for detector 7)

| DETECTOR No | TIMESETTING (Range: 0-10) |
|-------------|------------------------------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | 6.0 |
| 6 | 6.0 |
| 7 | 6.0 |
| 8 | 6.0 |
| 9 | |
| 10 | |
| 11 | |
| 12 | |

####

QUEUING FEATURE**APPROACH 1:**

- If XSF9 (Masterlink) or R- (Flexilink) is set, and the presence time for detector 5 and/or detector 6 is expired in BØ, and there is a demand for P1, expire approach 1

APPROACH 2:

- If XSF10 (Masterlink) or R+ (Flexilink) is set, and the presence time for detector 7 and/or detector 8 is expired, and there is a demand for P2 when a special timer (Refer Special Purpose Timesetting No 25) has expired, expire approach 2. The special timer starts when T1 expires.

DAILY EVENT TIMESETTINGS

| FUNCTION | TIMESETTING |
|-----------------------------|-------------|
| Daily start time (Hours) | |
| Daily start time (Minutes) | |
| Daily finish time (Hours) | |
| Daily finish time (Minutes) | |

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FLEXILINK OPERATION

PHASE SEQUENCES

| No | PHASE SEQUENCE |
|-----------|----------------|
| 1 (No Y+) | ABC |
| 2 (Y+) | |

NOTES:

####

1. All phases must be specified in the phase sequence
2. Only specify phase sequence 2 if it is different from phase sequence 1.

LOOK AHEADS & RELEASES

| PHASE SEQUENCE 1 | | |
|------------------|-------------|---------|
| PHASE | LOOK AHEAD* | RELEASE |
| A | No | No |
| B | No | No |
| C | No | No |
| D | | |
| E | | |
| F | | |
| G | | |

| PHASE SEQUENCE 2 | | |
|------------------|-------------|---------|
| PHASE | LOOK AHEAD* | RELEASE |
| A | | |
| B | | |
| C | | |
| D | | |
| E | | |
| F | | |
| G | | |

* Specify the phases to which look ahead is permitted, e.g. Yes (to E, F, G, A)

INHIBIT PHASES

The following phases can be inhibited in flexilink by setting the call pulse one step before the call pulse of the next phase in sequence

PULSE STEP LENGTH

☐ One Second ☒ Two Second

MASTERLINK & FLEXILINK SPECIAL FLAGS

| FLAG | FUNCTION |
|-----------|--|
| Y- Flexi | The site will operate in flexilink mode if the signal is continuously sent (C) or is used as an offset (e.g. 25) |
| Y- Master | |
| Y+ Flexi | |
| Z- Flexi | Choose alternative offset times: |
| Z- Master | Low Off Peak (No Z-, No Z+) Refer Special Purpose Timesettings 9 & 10 |
| Z+ Flexi | AM Peak (Z-, No Z+) Refer Special Purpose Timesettings 11 & 12 |
| Z+ Master | PM Peak (No Z-, Z+) Refer Special Purpose Timesettings 13 & 14 |
| Z+ Master | High Off Peak (Z-, Z+) Refer Special Purpose Timesettings 15 & 16 |
| R- Flexi | Queuing Feature (refer notes on page 6) |
| R+ Flexi | Queuing Feature (refer notes on page 6) |
| Q- Flexi | |
| Q+ Flexi | |

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SCATS INTERSECTION DATA

The data shown on this page is typical data that can be used for testing controller operations. This data is not necessarily applicable when the site is switched on in the field

###**TYPICAL SLOT DATA**

| | | | | | | |
|---------------|---|----------|---|---------------|---|---------|
| SLOT <i>n</i> | = | 3 | , | 1 | , | 0 |
| | | (phases) | | (split plans) | | (walks) |
| INT | = | 6048 | | | | |
| VC | = | 5 | | | | |
| CS | = | | | | | |
| COM | = | NET | | | | |
| PK | = | ! | | | | |
| S# | = | | | | | |
| LM | = | | | | | |
| RMN | = | ! | | | | |
| DCL | = | ! | | | | |
| | | | | | | |
| AT | = | 4 | | | | |
| BT | = | 6 | | | | |
| CT | = | 4 | | | | |
| DT | = | ! | | | | |
| ET | = | ! | | | | |
| FT | = | ! | | | | |
| W1 | = | !* | | | | |
| W1T | = | !* | | | | |
| W2 | = | !* | | | | |
| V2T | = | !* | | | | |
| W3 | = | ! | | | | |
| W3T | = | ! | | | | |
| W4 | = | ! | | | | |
| W4T | = | ! | | | | |
| PP1 | = | 0,0A | | | | |
| PP2 | = | 0,0A | | | | |
| PP3 | = | 0,0A | | | | |
| PP4 | = | 0,0A | | | | |

* Peds. Independent of Master

TYPICAL SPLIT PLAN DATA

| | |
|---------------------------------------|--------|
| PHASE SEQUENCE 1 | |
| A = | 0PDB |
| B* = | 50 NGC |
| C = | 17#NGA |
| CØ = WALK + CLEARANCE + 3 SECONDS | |
| * BØ MUST BE INCLUDED IN THE SEQUENCE | |
| AS SG1 CAN ONLY CLOSE DOWN IN BØ | |

| | | | | | |
|--------|----------|---|---|----|----|
| PED NO | PED NO | | | P1 | P2 |
| | GROUP NO | 1 | 2 | 3 | 4 |
| | 1 | | | X | |
| | 2 | | | | X |
| P1 | 3 | X | | | |
| P2 | 4 | | X | | |

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DATE 27/04/18

INT=6048

8/6/2018

PAGE

*** MAPPING TABLES

*** Input translation map

IMAP EQU *

SECT1 EQU *

FDB EXT1+P3 (P3 P.B.)

FDB EXT2+P1 (P1 P.B.)

FDB EXT3+P2 (P2 P.B.)

FDB EXT4+P4 (P4 P.B.)

FDB INT1+5 (APP 1 L)

FDB INT2+6 (APP 1 R)

FDB INT3+7 (APP 2 L)

FDB INT4+8 (APP 2 R)

FDB EXT5+9 (PEL ON/OFF)

FDB END

SECT2 EQU *

FDB END