

		<b>ACTION</b>	<b>DATE</b>
TO	1. SENIOR ENGINEER, CONTROLLER APPLICATIONS		
	2. IAN RIDGWELL, REGIONAL ROADS VICTORIA		
FROM	ANDREW BURUMA	DATE	17/12/20
SITE	GOULBURN VALLEY HIGHWAY / MIDLAND HIGHWAY	SITE NO.	6082
REGION	NORTH EASTERN	MUNICIPALITY	GREATER SHEPPARTON

## GENERAL

Works Program Job?	No	Project Number	44HSMAN
Classification	STANDARD	Works Order Number	4A007355

## EXISTING CONTROLLER DETAILS

Type	ATSC 4	Software Version & Release	V5R20	Lanterns	LED
------	--------	----------------------------	-------	----------	-----

## CONTROLLER APPLICATIONS

Target Date for Draft Opsheet	ASAP
Target Date for completion of Program	ASAP
Prepare Interlocking	

## PERSONALITY CHECKSUMS

	Hex	Octal
Total	6	6
Times	20	40
Pers	26	46

Dispatched 18/01/21

Update Graphics, Site Notes No ☐ Site ID Revision updated to

Description of changes Modified intergreen times due to 40km/h limit on all approaches. Changes as per highlighted

## REGIONAL ROADS VICTORIA - SIGNAL INSTALLATION

<input type="checkbox"/> Changes to signal hardware	<input type="checkbox"/> Changes to interlocking
<input type="checkbox"/> Additional detectors	<input type="checkbox"/> Changes to existing detector numbering
<input type="checkbox"/> Upgrade controller software to	
<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 checked="" type="checkbox"/> SCATS data changes - notify	ANDREW BURUMA	Ext	8080
	OR CHRIS EER	Ext	8711

before 3:00pm on the day before switch on.

SCATS Data Changes -

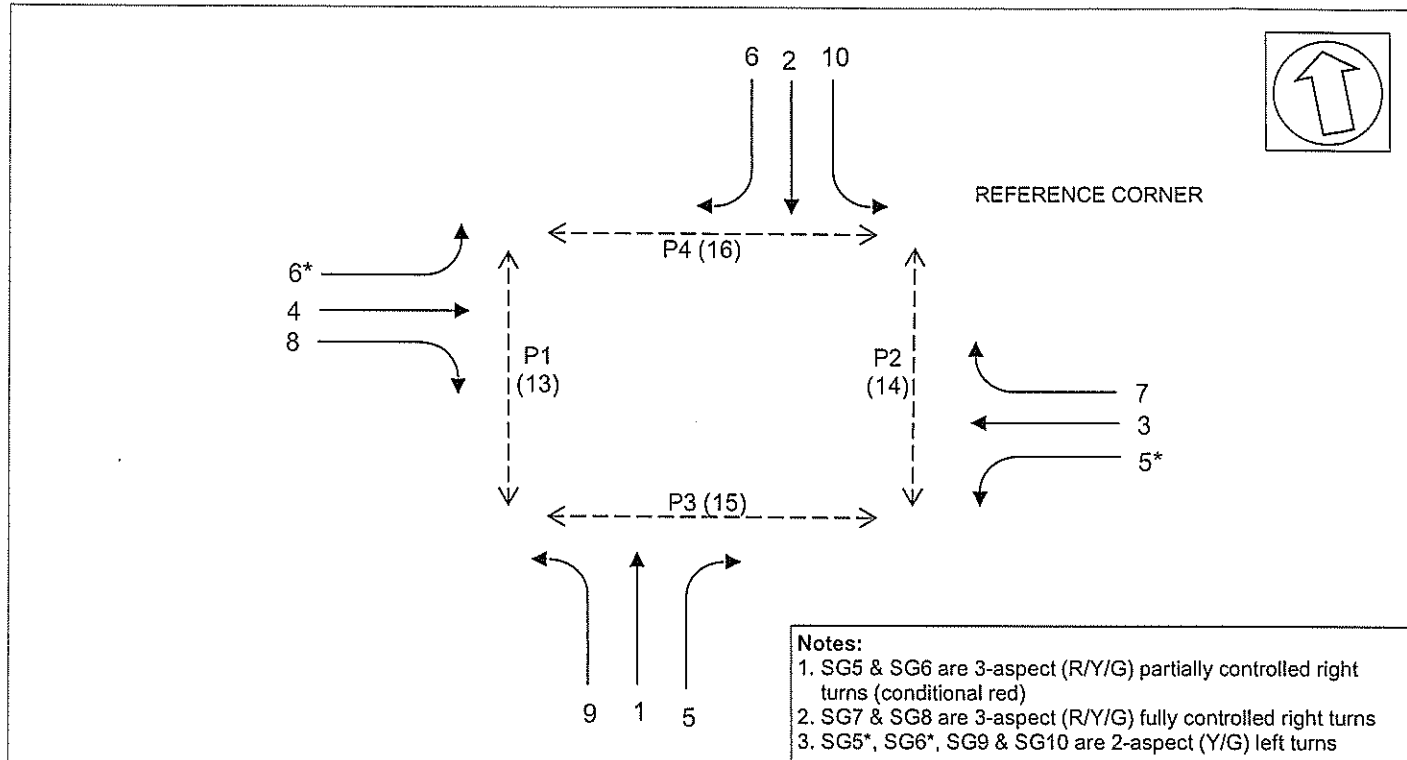
## TRAFFIC MANAGEMENT CENTRE

<input checked="" type="checkbox"/> Checksum update only
<input type="checkbox"/> Changes to trim or manual intervention features required
<input checked="" type="checkbox"/> Please notify ANDREW BURUMA (x8080) on job completion.

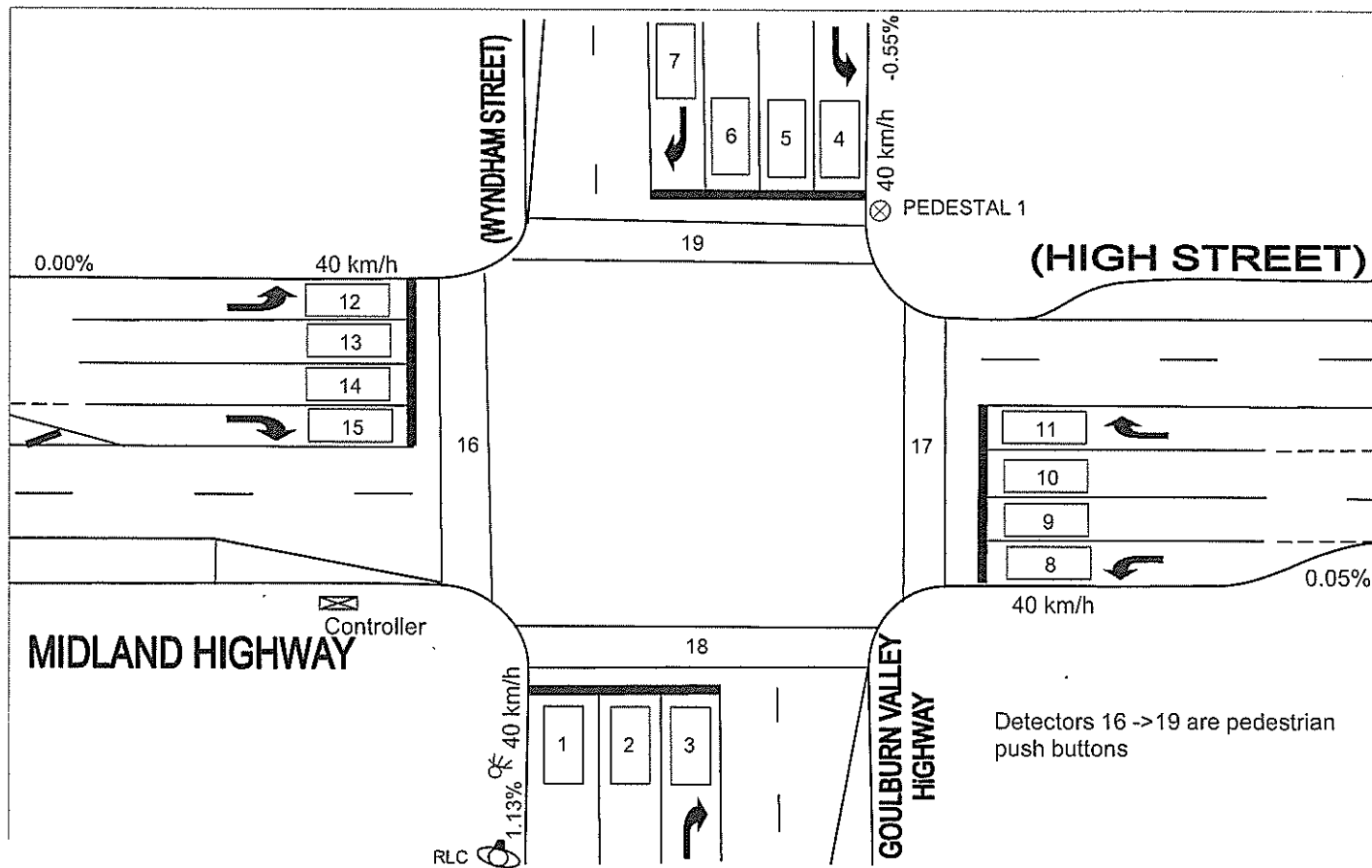
## DATE PROM INSTALLED

SITE NAME	<b>GOULBURN VALLEY HIGHWAY / MIDLAND HIGHWAY</b>			SITE NO.	<b>6082</b>
MUNICIPALITY	GREATER SHEPPARTON	DESIGNED BY	ANDREW BURUMA	DATE	17/12/20
PLAN NO.	431916 C	DESIGN CHECKED	<i>Chris Ren</i>	DATE	24/12/2020
CONTROLLER TYPE	ATSC 4	PROM CHECKED	<i>[Signature]</i>	DATE	14/1/21

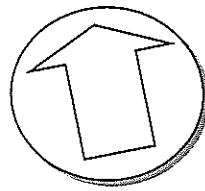
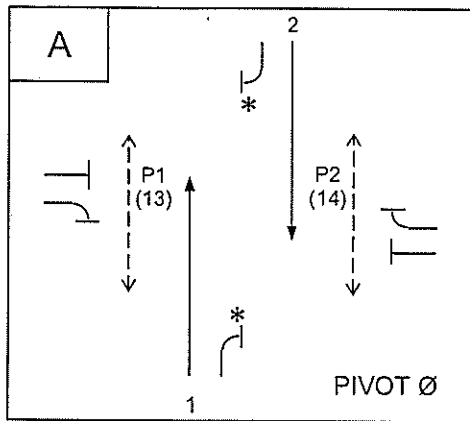
## GROUP ALLOCATION



## DETECTOR MAP

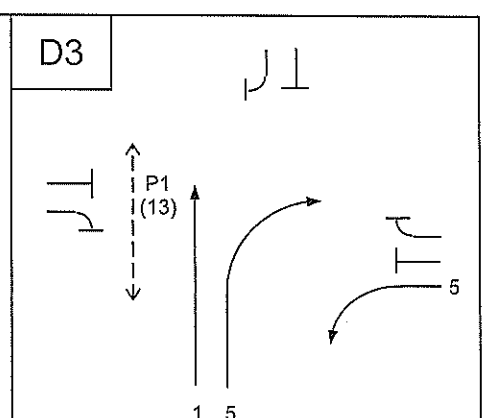
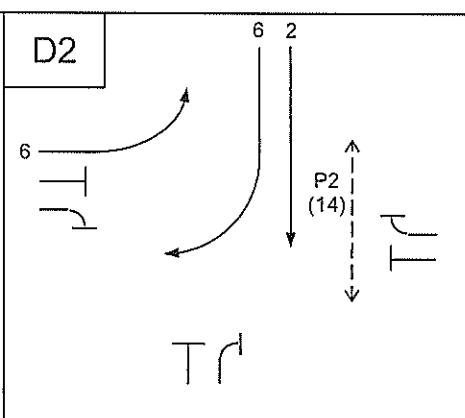
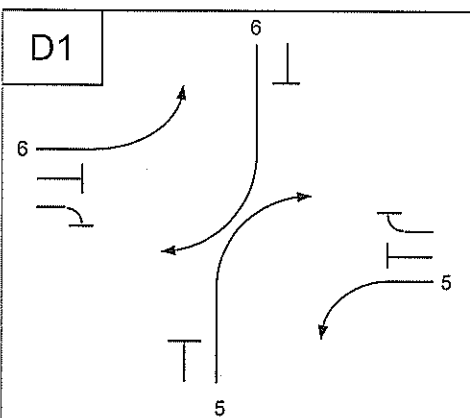
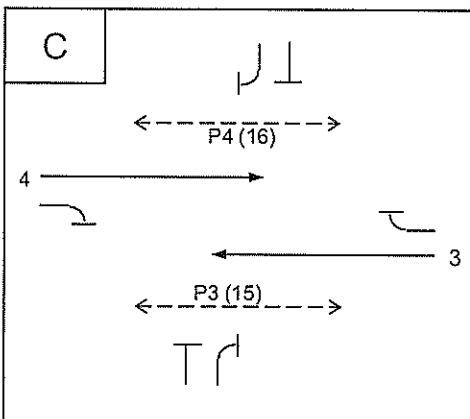
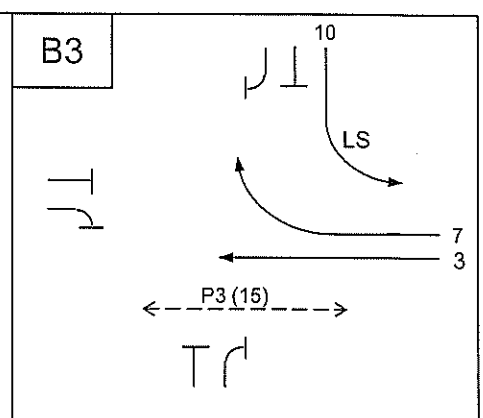
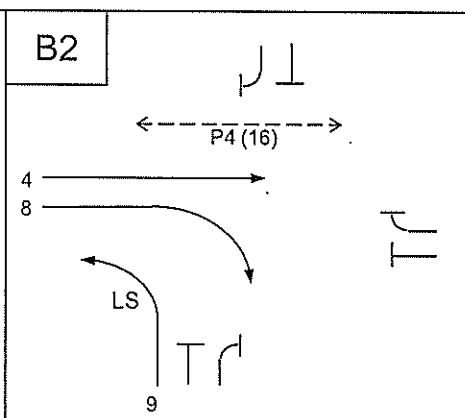
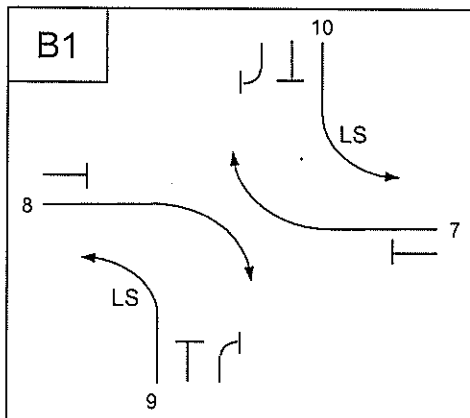


**PHASING DIAGRAM**



**Refer General Notes**  
\*Red arrow drop out operation at all times

PHASE	PROHIBITED PHASE CHANGES TO	REVERSION ON MAXIMUM	MAXIMUM V.I.G ON REVERSION



V.A. SEQUENCE ABCD

DESIGNED BY: ANDREW BURUMA

DATE 17/12/20

DETECTOR FUNCTIONS

DETECTOR No.	Internal / External	Input Number	CALL PHASE	LOCKING CALL	NON-LOCKING CAL	SET VIG ON PHASE	EXTEND PHASE	SPECIAL FUNCTION			DETECTOR ALARMS						
								Detector Type	Description	Refer Special Notes	DA Category	Disable	DA on S/C only	Fault Simulation			
														Call & Extend	Call Only	Ignore Alarm	Refer Special Notes
1	I	1	A	✓			A				0			✓			
2	I	2	A	✓			A				0			✓			
3	I	3	A,D	A	D		D			✓	0			✓			
4	I	4	A	✓			A,B				0			✓			
5	I	5	A	✓			A				0			✓			
6	I	6	A	✓			A				0			✓			
7	I	7	A,D	A	D		D			✓	0			✓			
8	I	8	C	✓			C,D			✓	0			✓			
9	I	9	C	✓			C				0			✓			
10	I	10	C	✓			C				0			✓			
11	I	11	B	✓			B				0			✓			
12	I	12	C	✓			C,D			✓	0			✓			
13	I	13	C	✓			C				0			✓			
14	I	14	C	✓			C				0			✓			
15	I	15	B	✓			B				0			✓			
16	E	1	A		✓			P1		✓	6		✓				
17	E	2	A		✓			P2		✓	6		✓				
18	E	3	C		✓			P3		✓	6		✓				
19	E	4	C		✓			P4		✓	6		✓				
20																	
21																	
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30																	
31																	
32																	

DESIGNED BY: ANDREW BURUMA

DATE 17/12/20

## APPROACH DEFINITIONS

### PHASE APPROACHES

Approach No	EXTENDING DETECTORS	APPROACH TIMER AND TIMESETTING DEFINITION*	SIGNAL GROUP	APPROACH EXPIRY (EXPAP)	Refer Special Notes
1	1,2	A11	1		
2	5,6	A22	2		
3	4	A33, B33	2,10	AØ → B1Ø, AØ → B3Ø	
4	11	B11	7		
5	15	B22	8		
6	9,10	C11	3		
7	13,14	C22	4		
8	8	C33, D33	3,5	CØ → D1Ø, CØ → D3Ø	
9	12	C44, D44	4,6	CØ → D1Ø, CØ → D2Ø	
10	3	D11	5		
11	7	D22	6		
12					
13					
14					
15					
16					

\* There are 8 approach timers and 4 approach timesettings available per phase:

- Where there are 4 or fewer approaches per phase, allocate one timesetting to each timer.

For example: A11, A22, A33, B11, C11.

- Where there are more than 4 approaches per phase, two or more timers must have the same timesetting.

For example: A11, A21, A32, A43, A54, B11.

### SPECIAL APPROACHES

Approach No	EXTENDING DETECTORS	APPROACH TIMESETTING	SIGNAL GROUP	DESCRIPTION	Refer Special Notes
1					
2					
3					
4					

## GENERAL NOTES

### **SUMMARY OF XSF FLAGS**

(Communications Operation of XSF flags is required)

- XSF1** – Allows for auto introduction of P1 and P2 (*all modes*).
- XSF2** – Allows for auto introduction of P3 and P4 (*all modes*).
- XSF3** – Permanent demand SG5 in DØ (*For event use*).
- XSF4** – Permanent demand SG6 in DØ (*For event use*).
- XSF5** – Select special maximum for SG5 in DØ via Special Purpose Timesetting No. 9.
- XSF6** – Select special maximum for SG6 in DØ via Special Purpose Timesetting No. 10.
- XSF7** – Select special maximum for SG7 & SG10 in BØ via Special Purpose Timesetting No. 11.
- XSF8** – Select special maximum for SG8 & SG9 in BØ via Special Purpose Timesetting No. 12.
- XSF9** – Permanent demand SG7 & SG10 in BØ (*For event use*).
- XSF10** – Permanent demand SG8 & SG9 in BØ (*For event use*).
- XSF11** – Allows P1 & P2 to respectively introduce anytime in D2Ø, D3Ø and at the start of AØ (*all modes*).
- XSF12** – Allows P3 & P4 to respectively introduce anytime in B2Ø, B3Ø and at the start of CØ (*all modes*).

### **GENERAL OPERATION**

- REVn. – First scan after start-up demands B1Ø and CØ.
- Clear phase demands during associated green and yellow times.
- If in AØ clear demands for DØ.
- If transitioning from AØ → DØ (*by master data*), run D1Ø.
- Late Start SG9 and SG10 in BØ when transitioning from AØ.

### **SIGNAL GROUP OPERATION**

#### **SIGNAL GROUP 5**

- Signal Group 5 is controlled by Special Movement Timer No. 1 within DØ. DØ All Red timesetting is substituted for Special Movement Time No. 1.
- XSF5 is used to set special maximum time for Signal Group 5 in DØ. This time is accessible in Special Purpose Timesetting No. 9. Signal Group 5 will be forced off after a period equal to the minimum green of the group (DØ minimum) plus this special maximum.

#### **SIGNAL GROUP 5 – Partially Controlled Right Turn (Red Arrow Drop Off Operation)**

- SG5 operates Green/Yellow/Red in DØ and can be switched to blank in AØ.
- If there is no P2 demand in AØ, SG5 red will be switched off at the end of AØ late start period.
- If P2 runs in AØ, SG5 is held red in AØ for the duration of Timer 1 (which starts timing at the start of P2 Walk using Special Purpose Timesetting No. 21). When Timer 1 expires, SG5 red is switched off in AØ if it is later than AØ late start period.
- AØ ECO is used to guarantee SG5 minimum blank period in AØ. Timer 2 (Special Purpose Timesetting No. 22) starts timing at the beginning of SG5 blank period. When Timer 2 expires, expire AØ ECO period from this approach.
- SG5 goes red at the start of SG1 red in AØ.
- SG5 is held red in BØ and CØ.
- Detector 3 will place locking calls for AØ & non-locking call for DØ and extend DØ.

### **SIGNAL GROUP 6**

- Signal Group 6 is controlled by Special Movement Timer No. 2 within DØ. DØ All Red timesetting is substituted for Special Movement Time No. 2.
- XSF6 is used to set special maximum time for Signal Group 6 in DØ. This time is accessible in Special Purpose Timesetting No. 10. Signal Group 6 will be forced off after a period equal to the minimum green of the group (DØ minimum) plus this special maximum.

### **SIGNAL GROUP 6 – Partially Controlled Right Turn (Red Arrow Drop Off Operation)**

- SG6 operates Green/Yellow/Red in DØ and can be switched to blank in AØ.
- If there is no P1 demand in AØ, SG6 red will be switched off at the end of AØ late start period.
- If P1 runs in AØ, SG6 is held red in AØ for the duration of Timer 3 (which starts timing at the start of P1 Walk using Special Purpose Timesetting No. 23). When Timer 3 expires, SG6 red is switched off in AØ if it is later than AØ late start period.
- AØ ECO is used to guarantee SG6 minimum blank period in AØ. Timer 4 (Special Purpose Timesetting No. 24) starts timing at the beginning of SG6 blank period. When Timer 4 expires, expire AØ ECO period from this approach.
- SG6 goes red at the start of SG2 red in AØ.
- SG6 is held red in BØ and CØ.
- Detector 7 will place locking calls for AØ & non-locking call for DØ and extend DØ.

### **SIGNAL GROUP 7**

- Signal Group 7 is controlled by Special Movement Timer No. 3 within BØ. BØ All Red timesetting is substituted for Special Movement Time No. 3.
- XSF7 is used to set special maximum time for Signal Group 7 & Signal Group 10 in BØ. This time is accessible in Special Purpose Timesetting No. 11. Signal Group 7 & Signal Group 10 will be forced off after a period equal to the minimum green of the group (BØ minimum) plus this special maximum.

### **SIGNAL GROUP 8**

- Signal Group 8 is controlled by Special Movement Timer No. 4 within BØ. BØ All Red timesetting is substituted for Special Movement Time No. 4.
- XSF8 is used to set special maximum time for Signal Group 8 & Signal group 9 in BØ. This time is accessible in Special Purpose Timesetting No. 12. Signal Group 8 & Signal Group 9 will be forced off after a period equal to the minimum green of the group (BØ minimum) plus this special maximum.

### **SIGNAL GROUP 9**

- Signal Group 9 is controlled by Special Movement Timer No. 5 within BØ. BØ All Red timesetting is substituted for Special Movement Time No. 5.

### **SIGNAL GROUP 10**

- Signal Group 10 is controlled by Special Movement Timer No. 6 within BØ. BØ All Red timesetting is substituted for Special Movement Time No. 6.

## **PEDESTRIAN GROUP OPERATION**

### **Pedestrian 1**

- P1 calls AØ.
- If XSF11 is set:
  - P1 can introduce anytime in D3Ø & at the start of AØ and can overlap D3Ø→AØ.
- If XSF11 is not set:
  - P1 can only introduce at the start of SG1 and can overlap D3Ø→AØ.
- P1 auto introduces at start of SG1 when XSF1 is set (all modes).
- P1 calls away CØ when resting in AØ.

### **Pedestrian 2**

- P2 calls AØ.
- If XSF11 is set:
  - P2 can introduce anytime in D2Ø & at the start of AØ and can overlap D2Ø→AØ.
- If XSF11 is not set:
  - P2 can only introduce at the start of SG1 and can overlap D2Ø→AØ.
- P2 auto introduces at start of SG2 when XSF1 is set (all modes).
- P2 calls away CØ when resting in AØ.

### **Pedestrian 3**

- P3 calls CØ.
- If XSF12 is set:
  - P3 can introduce anytime in B3Ø & at the start of CØ and can overlap B3Ø→CØ.
- If XSF12 is not set:
  - P3 can only introduce at the start of SG3 and can overlap B3Ø→CØ.
- P3 auto introduces at start of SG3 when XSF2 is set (all modes).

### **Pedestrian 4**

- P4 calls CØ.
- If XSF12 is set:
  - P4 can introduce anytime in B2Ø & at the start of CØ and can overlap B2Ø→CØ.
- If XSF12 is not set:
  - P4 can only introduce at the start of SG4 and can overlap B2Ø→CØ.
- P4 auto introduces at start of SG4 when XSF2 is set (all modes).

## **DETECTOR OPERATION**

### **Detector 3**

- Detector 3 places a non-locking call for DØ when its presence timer has expired.

### **Detector 4**

- Expire the extension of AØ via detector 4 if SG7 is demanded in BØ.

### **Detector 7**

- Detector 7 places a non-locking call for DØ when its presence timer has expired.

### **Detector 8**

- Clear calls for CØ from detector 8 during SG5 green and yellow.
- Expire the extension of CØ via detector 8 if SG5 is demanded in DØ.

### **Detector 12**

- Clear calls for CØ from detector 12 during SG6 green and yellow.
- Expire the extension of CØ via detector 12 if SG6 is demanded in DØ.



## DESIGN OF INTERGREEN AND PEDESTRIAN TIMES

### INTERGREEN TIMES

PHASE	CLEARANCE DETAILS			LEGAL SPEED	DESIGN SPEED		INTERGREEN		
	GROUP TRANSITION	DISTANCE	GRADE (%)*		YELLOW	RED	YELLOW	RED	TOTAL
A	1 → P4	32.0	1.13	40	40	40	3.0	3.0	6.0
B	7 → P4	28.0	0.05	40	40	40	3.0	2.5	5.5
C	4 → P2	32.0	0.00	40	40	40	3.0	3.0	6.0
D	5 → P1	27.0	1.13	40	40	40	3.0	2.5	5.5
E	→								
F	→								
G	→								

\*Positive grade indicates an uphill approach & negative grade indicates a downhill approach. Specify negative grade values with a "-" prefix

### PHASE SPECIAL ALL REDS AND SPECIAL MOVEMENT ALL REDS

FROM PHASE	TO PHASE	CLEARANCE DETAILS		DESIGN SPEED	ALL RED	PHASE or S.M. No**
		GROUP TRANSITION	DISTANCE			
B1	B2	7 → P4	28	40	2.5	SM3
B1	B3	8 → P3	27	40	2.5	SM4
D1	D2	5 → P2	27	40	2.5	SM1
D1	D3	6 → P1	27	40	2.5	SM2
		→				
		→				

\*\* Specify where the timesetting is stored (the phase special all red or the special movement time setting number)

### PEDESTRIAN TIMES

PED	PHASE(S)	WALK			CLEARANCE				MINIMUM SOLID DON'T WALK
		DISTANCE (m)	TIME		DISTANCE (m)	TIME			
			GRAPH	ADOPTED		GRAPH	CL1	CL2	
1	A	20.0	8	8	20.0	13	13.0	0.0	6.0
2	A	20.0	8	8	20.0	13	13.0	0.0	6.0
3	C	20.0	8	8	20.0	13	12.0	1.0	5.0
4	C	20.0	8	8	20.0	13	12.0	1.0	5.0

DESIGNED BY: ANDREW BURUMA

DATE 17/12/20

**CONTROLLER TIMESETTINGS - 1****PHASE TIMESETTINGS**

Front Panel Command: Phase No.Timesetting No (e.g. 3.2 accesses C phase late start)

DESCRIPTION	Timesetting No	PHASE						
		A (1)	B (2)	C (3)	D (4)	E (5)	F (6)	G (7)
RED / YELLOW	1	-	-	-	-	-	-	-
LATE START	2	2	2	-	-			
MINIMUM GREEN	3	10	5	8	6			
INCREMENT	4	-	-	-	-			
MAXIMUM INITIAL GREEN*	5	-	-	-	-			
MAXIMUM EXTENSION GREEN	6	20	10	20	4			
EARLY CUT OFF	7	4.0						
YELLOW	8	3.0	3.0	3.0	3.0			
ALL RED	9	3.0	2.5	3.0	2.5			
SPECIAL ALL RED	10	-	-	-	-			
GAP 1	11	2.5	2.5	2.5	2.5			
GAP 2	12	2.5	2.5	2.5	2.5			
GAP 3	13	2.5	2.5	2.5	2.5			
GAP 4	14	-	-	2.5	2.5			
HEADWAY 1	15	0.6	1.2	0.6	1.2			
HEADWAY 2	16	0.6	1.2	0.6	1.2			
HEADWAY 3	17	1.2	1.2	1.2	1.2			
HEADWAY 4	18	-	-	1.2	1.2			
WASTE 1	19	7	7	7	7			
WASTE 2	20	7	7	7	7			
WASTE 3	21	7	7	7	7			
WASTE 4	22	-	-	7	7			

\* Maximum Initial Green = Minimum Green + V.I.G.

**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	8.0	8.0	8.0	8.0				
CLEARANCE 1	3	13.0	13.0	12.0	12.0				
CLEARANCE 2	4			1.0	1.0				

\* Minimum walk time - used in Isolated and Flexilink operation

For walk times in Masterlink operation, refer to slot data.

DESIGNED BY: **ANDREW BURUMA**DATE **17/12/20**

## 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	2.5	SG5 ALL RED (SUBSTITUTE DØ ALL RED)
2	2.5	SG6 ALL RED (SUBSTITUTE DØ ALL RED)
3	2.5	SG7 ALL RED (SUBSTITUTE BØ ALL RED)
4	2.5	SG8 ALL RED (SUBSTITUTE BØ ALL RED)
5	2.5	SG9 ALL RED (SUBSTITUTE BØ ALL RED)
6	2.5	SG10 ALL RED (SUBSTITUTE BØ ALL RED)
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	4	SG5 Special maximum extension green in DØ if XSF5 is set
10	4	SG6 Special maximum extension green in DØ if XSF6 is set
11	4	SG7 & SG10 Special maximum extension green in BØ if XSF7 is set
12	4	SG8 & SG9 Special maximum extension green in BØ if XSF8 is set
13	8	P1 Walk time substitution when Y+ ( <i>Flexilink</i> ) is set
14	8	P2 Walk time substitution when Y+ ( <i>Flexilink</i> ) is set
15	8	P3 Walk time substitution when Y+ ( <i>Flexilink</i> ) is set
16	8	P4 Walk time substitution when Y+ ( <i>Flexilink</i> ) is set
17		
18	0	LIMIT GREEN WATCHDOG TIMER
19	0	SPECIAL FACILITY CONTROLS ALARM TIMER
20	10	ALL RED START UP INTERVAL
21	8	Timer 1 : Hold SG5 red when P2 runs in AØ
22	4	Timer 2 : Guarantee SG5 minimum blank period in AØ
23	8	Timer 3 : Hold SG6 red when P1 runs in AØ
24	4	Timer 4 : Guarantee SG6 minimum blank period in AØ
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		

DESIGNED BY: ANDREW BURUMA

DATE 17/12/20

**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	3.0
4	
5	
6	
7	3.0
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

NOTE: Set presence time to zero if the detector is not a presence detector

**DAILY EVENT TIMESETTINGS**

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

DESIGNED BY: ANDREW BURUMA

DATE 17/12/20

## FLEXILINK OPERATION

## PHASE SEQUENCES

No	PHASE SEQUENCE
1 (No Y+)	ABCD
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 &amp; RELEASES

PHASE SEQUENCE 1		
PHASE	LOOK AHEAD*	RELEASE
A	No	R-
B	No	Auto
C	Yes (to D, A)	R+
D	Yes (to A)	Auto
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

DØ

## PULSE STEP LENGTH

☐ One Second ☒ Two Second

## MASTERLINK &amp; 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	P1 → P4 Walk time substitutions (Refer Special Purpose Timesetting Nos. 13 → 16)
Z- Flexi	
Z- Master	
Z+ Flexi	
Z+ Master	
R- Flexi	AØ RELEASE PULSE
R+ Flexi	CØ RELEASE PULSE
Q- Flexi	
Q+ Flexi	

DESIGNED BY: ANDREW BURUMA

DATE

17/12/20

## 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>	=	4	,	4	,	4
		(phases)		(split plans)		(walks)
INT	=	6082				
VC	=	5				
CS	=					
COM	=	NET				
PK	=	!				
S#	=	23				
LM	=	MF				
RMN	=	0				
DCL	=	0				
AT	=	6				
BT	=	6				
CT	=	6				
DT	=	6				
ET	=					
FT	=					
GT	=					
W1	=	2A	W1 T	=	19	
W2	=	2A	W2 T	=	19	
W3	=	2C	W3 T	=	18	
W4	=	2C	W4 T	=	18	
W5	=		W5 T	=		
W6	=		W6 T	=		
W7	=		W7 T	=		
W8	=		W8 T	=		
PP1	=	0,0A				
PP2	=	0,0A				
PP3	=	0,0A				
PP4	=	0,0A				

## TYPICAL SPLIT PLAN DATA

PHASE SEQUENCE 1		PHASE SEQUENCE 2		PHASE SEQUENCE 3	
A =	0PDB	A =		A =	
B =	20C	B =		B =	
C =	30D	C =		C =	
D =	15TGA	D =		D =	

## TYPICAL VARIATION PARAMETERS

VP1	=		VP22	=		VP43	=	
VP2	=		VP23	=		VP44	=	
VP3	=		VP24	=		VP45	=	
VP4	=		VP25	=		VP46	=	
VP5	=		VP26	=		VP47	=	
VP6	=		VP27	=		VP48	=	
VP7	=		VP28	=		VP49	=	
VP8	=		VP29	=		VP50	=	
VP9	=		VP30	=		VP51	=	
VP10	=		VP31	=		VP52	=	
VP11	=		VP32	=		VP53	=	
VP12	=		VP33	=		VP54	=	
VP13	=		VP34	=		VP55	=	
VP14	=		VP35	=		VP56	=	
VP15	=		VP36	=		VP57	=	
VP16	=		VP37	=		VP58	=	
VP17	=		VP38	=		VP59	=	
VP18	=		VP39	=		VP60	=	
VP19	=		VP40	=		VP61	=	
VP20	=		VP41	=		VP62	=	
VP21	=		VP42	=				

# GROUP CONFLICT TABLE

PED NO	PED NO					m	m			m	m														
	GROUP NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	1			X	X		X	X	X							X	X								
	2			X	X	X		X	X							X	X								
	3	X	X			X	X		X	X				X	X										
	4	X	X			X	X	X			X			X	X										
m	5		X	X	X			X	X		X				X	X									
m	6	X		X	X			X	X	X				X			X								
	7	X	X		X	X	X								X		X								
	8	X	X	X		X	X							X		X									
m	9			X			X							X		X									
m	10				X	X									X		X								
	11																								
	12																								
	13			X	X		X		X	X															
	14			X	X	X		X			X														
	15	X	X			X			X	X															
	16	X	X				X	X			X														
	17																								
	18																								
	19																								
	20																								
	21																								
	22																								
	23																								
	24																								

CHECKED: Sarath Premachandra DATE: 8/02/10

DESIGNED BY: ANDREW BURUMA

DATE 17/12/20

```

PAGE
***  MAPPING TABLES
***  Input translation map
IMAP EQU  *
SECT1 EQU  *
      FDB  INT1+1      ( AD PHASE 1 )
      FDB  INT2+2      ( AD PHASE 2 )
      FDB  INT3+3      ( AD PHASE 3 )
      FDB  INT4+4      ( AD PHASE 4 )
      FDB  INT5+5      ( AD PHASE 5 )
      FDB  INT6+6      ( AD PHASE 6 )
      FDB  INT7+7      ( AD PHASE 7 )
      FDB  INT8+8      ( C PHASE 8 )
      FDB  INT9+9      ( C PHASE 9 )
      FDB  INT10+10     ( C PHASE 10 )
      FDB  INT11+11     ( B PHASE 11 )
      FDB  INT12+12     ( C PHASE 12 )
      FDB  INT13+13     ( C PHASE 13 )
      FDB  INT14+14     ( C PHASE 14 )
      FDB  INT15+15     ( B PHASE 15 )
      FDB  EXT1+P1      ( P1 P.B. )
      FDB  EXT2+P2      ( P2 P.B. )
      FDB  EXT3+P3      ( P3 P.B. )
      FDB  EXT4+P4      ( P4 P.B. )
      FDB  END
SECT2 EQU  *
      FDB  END

```