

	ACTION	DATE
TO	1. SENIOR ENGINEER, CONTROLLER APPLICATIONS	
	2. STEVE BELZ, PROGRAM DELIVERY	
FROM	NATHAN CORCORAN	DATE 20/10/20
SITE	MITCHELL STREET/ QUEEN STREET	SITE NO. 6273
REGION	RRV - NORTHERN	MUNICIPALITY GREATER BENDIGO

GENERAL

Works Program Job?	No	Project Number	DK564C
Classification	MINOR	Works Order Number	4A007272

EXISTING CONTROLLER DETAILS

Type	PSC 2003	Software Version & Release	V5 R82	Lanterns	LED
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CONTROLLER APPLICATIONS

Target Date for Draft Opsheet	26/11/2020
Target Date for completion of Program	09/11/2020

Prepare Interlocking	No
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Update Graphics	No
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Description of changes	Timesetting changes for CBD 40km/h zone, changes to P1 and P2
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PERSONALITY CHECKSUMS

	Hex	Octal
Total	0F	17
Times	69	151
Pers	66	146

Dispatched 11/11/20

<input type="checkbox"/>	Site ID Revision updated to
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PROGRAM DELIVERY - 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	NATHAN CORCORAN	Ext	1210
	OR	DARREN VAUGHAN	Ext	1210
	before 3:00pm on the day before switch on.			

SCATS Data Changes - Slot data, delete RAM data

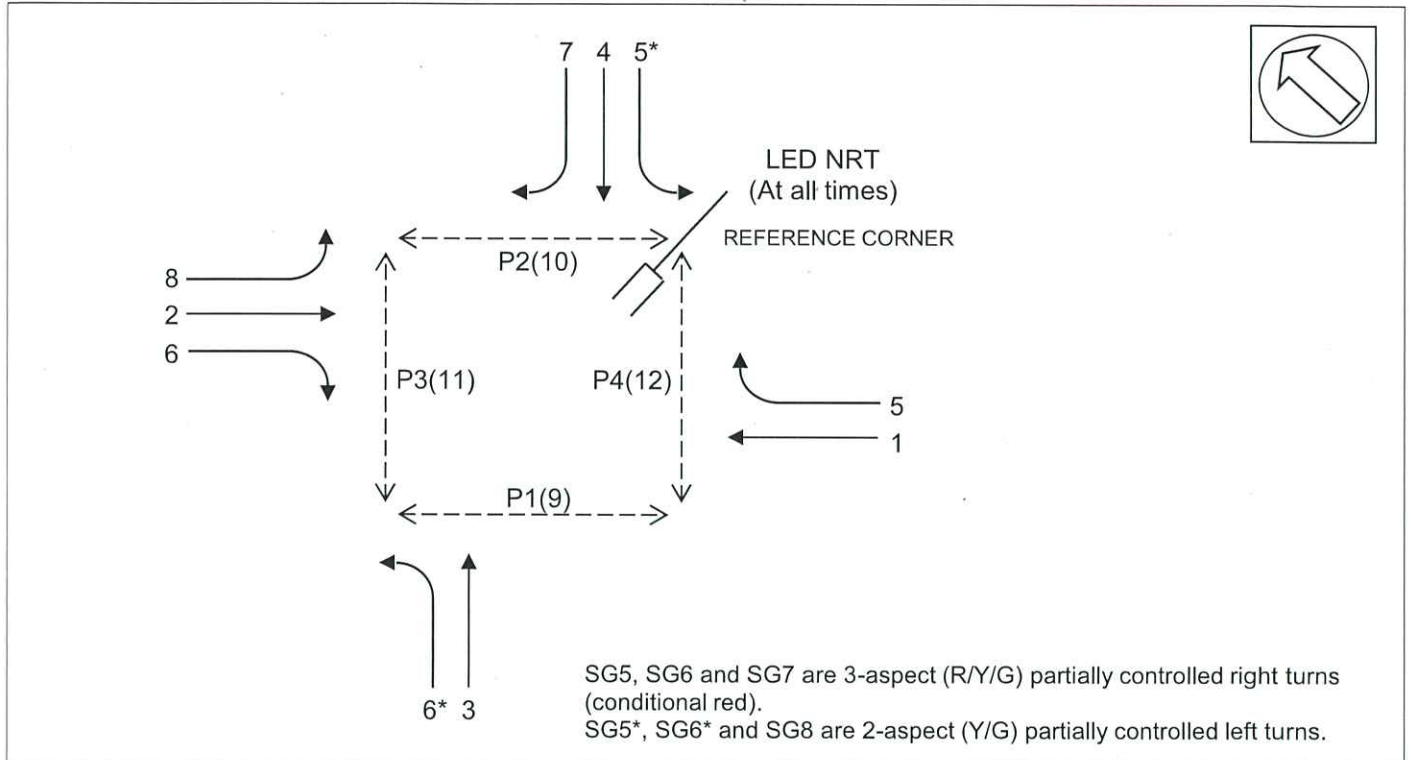
TRAFFIC MANAGEMENT CENTRE

<input type="checkbox"/>	Checksum update only
<input type="checkbox"/>	Changes to trim or manual intervention features required
<input checked="" type="checkbox"/>	Please notify NATHAN CORCORAN (x1210) on job completion.

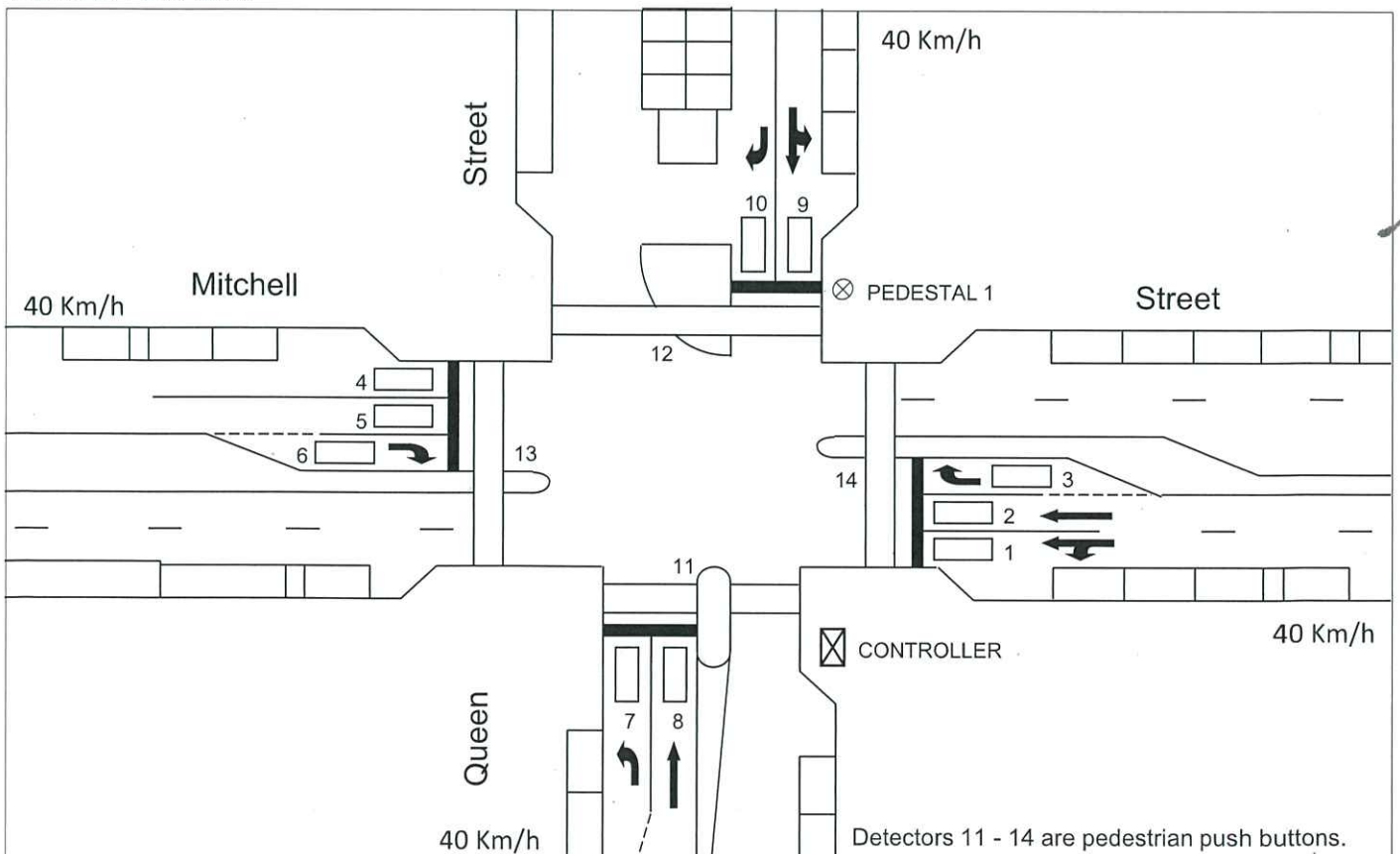
DATE PROM INSTALLED

SITE NAME	MITCHELL STREET/ QUEEN STREET			SITE NO.	6273
MUNICIPALITY	GREATER BENDIGO	DESIGNED BY	NATHAN CORCORAN	DATE	20/10/20
PLAN NO.	760434	DESIGN CHECKED	<i>N. J. B. H.</i>	DATE	2/11/20
CONTROLLER TYPE	PSC 2003	PROM CHECKED	<i>[Signature]</i>	DATE	18/11/20

GROUP ALLOCATION



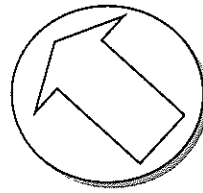
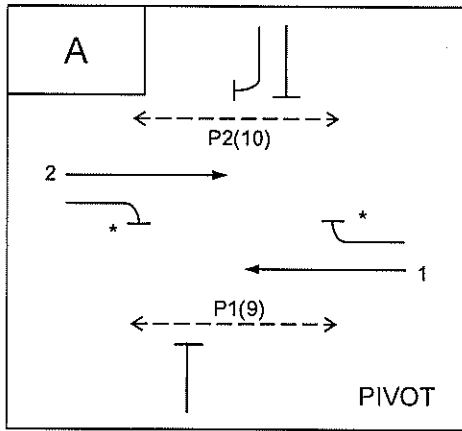
DETECTOR MAP



SITE NAME **MITCHELL STREET/ QUEEN STREET**

SITE NO. **6273**

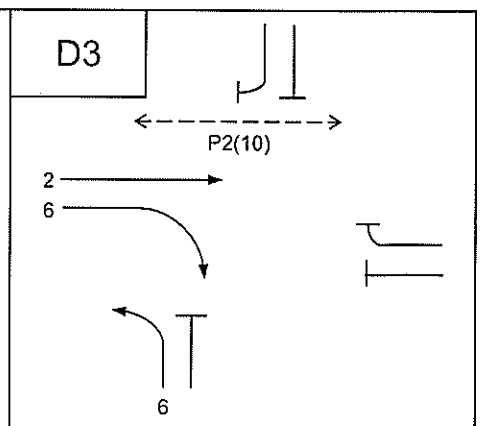
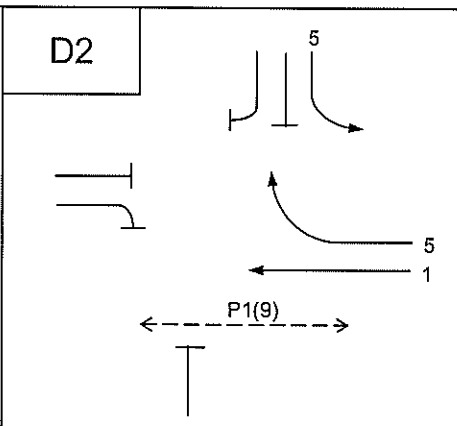
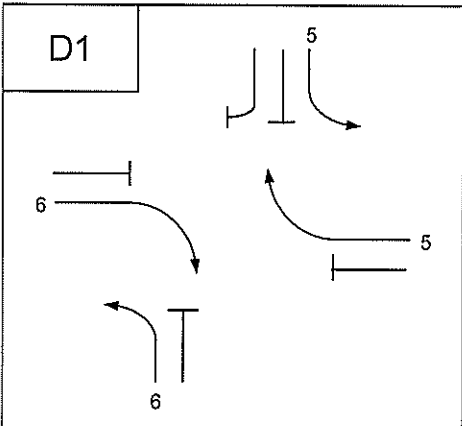
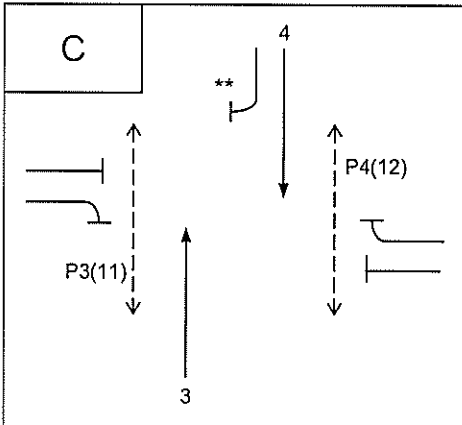
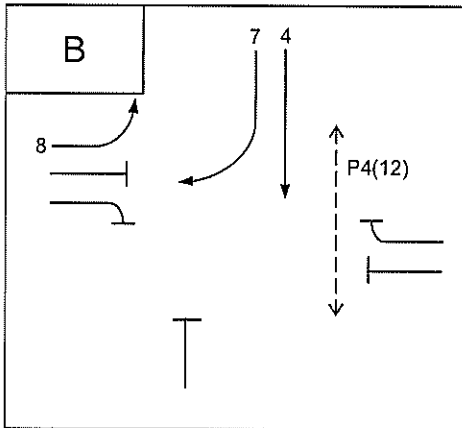
PHASING DIAGRAM



Refer General Notes

* Red arrow drops in AØ.
 ** Red arrow drops in CØ.
 Refer to General Notes, page 4/1.

PHASE	PROHIBITED PHASE CHANGES TO	REVERSION ON MAXIMUM	MAXIMUM V.I.G ON REVERSION
A	D		
C	B		



V.A. SEQUENCE A B C D

DESIGNED BY: NATHAN CORCORAN

DATE 20/10/20

SITE NAME

MITCHELL STREET/ QUEEN STREET

SITE NO.

6273

DETECTOR FUNCTIONS

DETECTOR No.	Internal / External	Input Number	CALL PHASE	LOCKING CALL	NON-LOCKING CALL	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	
1	I	1	A	✓			A				0			✓	
2	I	2	A	✓			A				0			✓	
3	I	3	A,D	A	D		A, D			✓	0			✓	
4	I	4	A	✓			A				0			✓	
5	I	5	A	✓			A				0			✓	
6	I	6	A,D	A	D		A, D			✓	0			✓	
7	I	7	C	✓			C, D			✓	0			✓	
8	I	8	C	✓			C				0			✓	
9	I	9	C	✓			C				0			✓	
10	I	10	B,C	C	B		B, C			✓	0			✓	
11	E	1	A		✓			P1		✓	6		✓		
12	E	2	A		✓			P2		✓	6		✓		
13	E	3	C		✓			P3		✓	6		✓		
14	E	4	C		✓			P4		✓	6		✓		
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															
31															
32															

DESIGNED BY: NATHAN CORCORAN

DATE

20/10/20

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	4, 5	A22	2		
3	3	A33, D11	1, 5		
4	6	A44, D22	2, 6		
5	7	C11, D33	3, 6	CØ → D1Ø, CØ → D3Ø	
6	8	C22	3		
7	9	C33	4		
8	10	B11, C44	4, 7		
9					
10					
11					
12					
13					
14					
15					
16					

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

- Where there are 4 or less 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)

- XSF2 - Allows BØ to only run every second cycle (Master & Flexi)
- XSF5 - Selects special maximum extension green for SG5 in DØ via Special Purpose Timesetting No. 9. (All modes)
- XSF6 - Selects special maximum extension green for SG6 in DØ via Special Purpose Timesetting No. 10. (All modes)

GENERAL OPERATION

1. If in AØ, clear demands for DØ.
2. If in CØ, clear demands for BØ.
3. Use CØ yellow for BØ yellow if going BØ → DØ or BØ → AØ.

SIGNAL GROUP OPERATION

Signal Group 5

1. SG5 is controlled by Special Movement Timesetting No. 1 in DØ.
DØ all red timesetting is substituted for Special Movement Timesetting No. 1.
2. XSF5 is used to set the special maximum extension green time for SG5 in DØ.
This time is stored in Special Purpose Timesetting No. 9.
SG5 is forced off after this special maximum extension green time.
3. SG5 operates green-yellow-red in DØ.
4. SG5 goes red with SG1 in AØ and remains red through BØ, CØ and D3Ø.
5. SG5 closes down at the end of D1Ø or D2Ø green, remains red through AØ late start period, then goes 'blank' at the start of AØ minimum green period.
6. When P2 is demanded:
 - a. If going BØ → AØ, CØ → AØ or D3Ø → AØ, with a demand for P2, hold SG5 red for the duration of Timer 1 (Special Purpose Timesetting No. 11). Timer 1 starts timing at the start of P2 walk. When Timer 1 expires, SG5 red is switched off.
 - b. If going D1Ø → AØ or D2Ø → AØ, with a demand for P2, SG5 goes red at the start of D1Ø or D2Ø all red period and is held red for the duration of Timer 1 (Special Purpose Timesetting No. 11). Timer 1 starts timing at the start of P2 Walk. When Timer 1 expires, SG5 red is switched off.
7. AØ ECO is used to guarantee SG5 minimum 'blank' period. Timer 3 (Special Purpose Timesetting No. 13) starts timing at the start of SG5 'blank' period. When Timer 3 expires, expire AØ ECO.

Signal Group 6

1. SG6 is controlled by Special Movement Timesetting No. 2 in DØ.
DØ all red timesetting is substituted for Special Movement Timesetting No. 2.
2. XSF6 is used to set the special maximum extension green time for SG6 in DØ.
This time is stored in Special Purpose Timesetting No. 10.
SG6 is forced off after this special maximum extension green time.
3. SG6 operates green-yellow-red in DØ.
4. SG6 goes red with SG2 in AØ and remains red through BØ, CØ and D2Ø.
5. SG6 closes down at the end of D1Ø or D3Ø green, remains red through AØ late start period, then goes 'blank' at the start of AØ minimum green period.
6. When P1 is demanded:
 - a. If going BØ → AØ, CØ → AØ or D2Ø → AØ, with a demand for P1, hold SG6 red for the duration of Timer 2 (Special Purpose Timesetting No. 12). Timer 2 starts timing at the start of P1 walk. When Timer 2 expires, SG6 red is switched off.

- b. If going D1Ø → AØ or D3Ø → AØ, with a demand for P1, SG6 goes red at the start of D1Ø or D3Ø all red period and is held red for the duration of Timer 2 (Special Purpose Timesetting No. 12). Timer 2 starts timing at the start of P1 Walk. When Timer 2 expires, SG6 red is switched off.
7. AØ ECO is used to guarantee SG6 minimum 'blank' period. Timer 3 (Special Purpose Timesetting No. 13) starts timing at the start of SG6 'blank' period. When Timer 3 expires, expire AØ ECO.

Signal Group 7

1. SG7 operates green-yellow-red in BØ.
2. SG7 goes red with SG4 in CØ and remains red through DØ and AØ.
3. SG7 closes down at the end of BØ green, remains red through CØ late start period, then goes 'blank' at the start of CØ minimum green period.
4. When P3 is demanded:
 - a. If going AØ → CØ, with a demand for P3, hold SG7 red for the duration of Timer 4 (Special Purpose Timesetting No. 14). Timer 4 starts timing at the start of P3 walk. When Timer 4 expires, SG7 red is switched off.
 - b. If going BØ → CØ, with a demand for P3, SG7 goes red at the start of BØ all red period and is held red for the duration of Timer 4 (Special Purpose Timesetting No. 14). Timer 4 starts timing at the start of P3 walk. When Timer 4 expires, SG7 red is switched off.
5. CØ ECO is used to guarantee SG7 minimum 'blank' period. Timer 5 (Special Purpose Timesetting No. 15) starts timing at the start of SG7 'blank' period. When Timer 5 expires, expire CØ ECO.

Signal Group 8

1. Late start SG8 in BØ if going AØ → BØ.

PEDESTRIAN GROUP OPERATION

Pedestrian 1

1. P1 calls AØ.
2. P1 is hidden in DØ.
3. P1 calls CØ if the controller is resting in AØ.
4. P1 can introduce at any time in D2Ø and during AØ late start period and can overlap D2Ø → AØ.
5. When Z- (Master) or Z- (Flexi) flag is set, P1 auto introduces with SG1 in DØ and AØ.
6. In Flexi, P1 Walk is terminated in AØ by setting Q+ flag (Q+ flag is set 3 steps before the call pulse for BØ).

Pedestrian 2

1. P2 calls AØ.
2. P2 is hidden in DØ.
3. P2 calls CØ if the controller is resting in AØ.
4. P2 can introduce at any time in D3Ø and during AØ late start period and can overlap D3Ø → AØ.
5. When Z- (Master) or Z- (Flexi) flag is set, P2 auto introduces with SG2 in DØ and AØ.
6. In Flexi, P2 Walk is terminated in AØ by setting Q+ flag (Q+ flag is set 3 steps before the call pulse for BØ).

Pedestrian 3

1. P3 calls CØ.
2. When Z+ (Master) or Z+ (Flexi) flag is set, P3 auto introduces in CØ.
3. P3 can introduce at the start of CØ.

Pedestrian 4

1. P4 calls CØ.
2. When Z+ (Master) or Z+ (Flexi) flag is set, P4 auto introduces with SG4 in BØ and CØ.
3. P4 can introduce at any time in BØ and at the start of CØ and can overlap BØ → CØ.

PHASE OPERATION**Phase B**

When XSF2 is set, BØ can only run every second cycle (Master & Flexi)

DETECTOR OPERATION**General**

1. Clear vehicle demands during associated phase green and yellow.

Detector 3

1. Detector 3 places locking calls for AØ and, when its presence time expires, places non-locking calls for DØ (SG5) and extends AØ and DØ (SG5).
2. Clear demands for DØ (SG5) from detector 3 during SG5 green and yellow.

Detector 6

1. Detector 6 places locking calls for AØ and, when its presence time expires, places non-locking calls for DØ (SG6) and extends AØ and DØ (SG6).
2. Clear demands for DØ (SG6) from detector 6 during SG6 green and yellow.

Detector 7

1. Clear demands for CØ from detector 7 during SG3 and SG6 green and yellow.

Detector 10

1. Detector 10 places locking calls for CØ and, when its presence time expires, places non-locking calls for BØ and extends BØ and CØ.
2. Clear demands for BØ from detector 10 during SG7 green and yellow.

SITE NAME **MITCHELL STREET/ QUEEN STREET**SITE NO. **6273****DESIGN OF INTERGREEN AND PEDESTRIAN TIMES****INTERGREEN TIMES**

PHASE	CLEARANCE DETAILS		LEGAL SPEED	DESIGN SPEED		INTERGREEN		
	GROUP TRANSITION	DISTANCE		YELLOW	RED	YELLOW	RED	TOTAL
A	1 → P3	31.5	40	40	40	3.0	3.0	6.0
B	7 → P3	32.0	40	40	40	3.0	3.0	6.0
C	3 → P2	32.0	40	40	40	3.0	3.0	6.0
D	6 → P1	30.0	40	40	40	3.0	3.0	6.0
E	→							
F	→							
G	→							

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			
		→				
		→				
		→				
		→				
		→				
		→				

* 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	
P1	A D2	10.0	10	10	7.0	5	5.0		6.0
P2	A D3	13.5	13	13	8.5	6	6.0		6.0
P3	C	17.5	8	10	17.5	12	12.0		6.0
P4	C B	19.0	8	10	19.0	13	13.0		6.0

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	2				
MINIMUM GREEN	3	8	5	6	6			
INCREMENT	4							
MAXIMUM INITIAL GREEN*	5							
MAXIMUM EXTENSION GREEN	6	35	10	15	5			
EARLY CUT OFF	7	4.0		4.0				
YELLOW	8	3.0	3.0	3.0	3.0			
ALL RED	9	3.0	3.0	3.0	3.0			
SPECIAL ALL RED	10							
GAP 1	11	2.5	2.5	2.5	2.5			
GAP 2	12	2.5		2.5	2.5			
GAP 3	13	2.5		2.5	2.5			
GAP 4	14	2.5		2.5				
HEADWAY 1	15	0.6	1.2	1.2	1.2			
HEADWAY 2	16	0.6		1.2	1.2			
HEADWAY 3	17	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			
WASTE 3	21	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	10.0	13.0	10.0	10.0				
CLEARANCE 1	3	5.0	6.0	12.0	13.0				
CLEARANCE 2	4								

* Minimum walk time - used in Isolated and Flexilink operation

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

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	3.0	SG5 all red (substitute DØ all red)
2	3.0	SG6 all red (substitute DØ 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	5	SG5 maximum extension green in DØ (XSF5)
10	5	SG6 maximum extension green in DØ (XSF6)
11	13	Timer 1: Duration for holding SG5 red in AØ with P2 demanded
12	10	Timer 2: Duration for holding SG6 red in AØ with P1 demanded
13	4	Timer 3: Minimum 'blank' period for SG5 and SG6
14	10	Timer 4: Duration for holding SG7 red in CØ with P3 demanded
15	4	Timer 5: Minimum 'blank' period for SG7
16		
17		
18	0	LIMIT GREEN WATCHDOG TIMER
19	0	SPECIAL FACILITY CONTROLS ALARM TIMER
20	10	ALL RED START UP INTERVAL
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		

SCATS Data Changes - Slot data, delete RAM data

DESIGNED BY: NATHAN CORCORAN

DATE 20/10/20

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	2.0
4	
5	
6	2.0
7	
8	
9	
10	2.0
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)	

FLEXILINK OPERATION**PHASE SEQUENCES**

No	PHASE SEQUENCE
1 (No Y+)	A B C D
2 (Y+)	A B C D

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	R-
B	Yes (to C,D,A)	R+
C	Yes (to D, A)	Q-
D	Yes (to A)	Auto
E		
F		
G		

PHASE SEQUENCE 2		
PHASE	LOOK AHEAD*	RELEASE
A	No	R-
B	No	R+
C	Yes (to D,A)	Q-
D	Yes (to A)	Auto
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 **B, D**

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	Select alternate sequence
Z- Flexi	P1 auto introduces with SG1 in DØ and AØ.
Z- Master	P2 auto introduces with SG2 in DØ and AØ.
Z+ Flexi	Auto introduces P3 in CØ and P4 with SG4 in BØ and CØ.
Z+ Master	
R- Flexi	AØ RELEASE PULSE
R+ Flexi	BØ RELEASE PULSE
Q- Flexi	CØ RELEASE PULSE
Q+ Flexi	Terminates P1 and P2 Walk in AØ (Q+ pulse is set 3 steps before call pulse for BØ)

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	,	1	,	4
		(phases)		(split plans)		(peds)
INT	=	6273				
VC	=	5				
CS	=					
COM	=	NET				
PK	=	!				
S#	=					
LM	=					
RMN	=	0				
DCL	=	0				
VP#	=					
AT	=	6				
BT	=	6				
CT	=	6				
DT	=	6				
ET	=					
FT	=					
GT	=					
W1	=	0	W1 T	=	11	
W2	=	0	W2 T	=	12	
W3	=	10	W3 T	=	18	
W4	=	2C	W4 T	=	19	
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 =	0 PD B	A =	0 PDNGFG B	A =	
B =	15 C	B =	15 C	B =	
C =	25 TG D	C =	25 D	C =	
D =	15 TG A	D =	15 TG A	D =	

TYPICAL VARIATION PARAMETERS

VP1 =	57	VP22 =		VP43 =	
VP2 =	61	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	P1	P2	P3	P4													
	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													
	2			X	X	X		X				X	X													
	3	X	X			X	X	X	X	X	X															
	4	X	X			X	X			X	X															
m	5		X	X	X			X	X		X		X													
m	6	X		X	X			X		X		X														
m	7	X	X	X		X	X				X	X														
m	8			X		X					X	X														
P1	9			X	X		X																			
P2	10			X	X	X		X	X																	
P3	11	X	X				X	X	X																	
P4	12	X	X			X																				
	13																									
	14																									
	15																									
	16																									
	17																									
	18																									
	19																									
	20																									
	21																									
	22																									
	23																									
	24																									

CHECKED: Tien Vu

DATE: 28/09/10