

		ACTION	DATE
TO	1. SENIOR ENGINEER, CONTROLLER APPLICATIONS		
	2. STEVE BELZ, PROGRAM DELIVERY		
FROM	NECATI UYAR	DATE	24/07/19
SITE	MIDLAND HIGHWAY NR GRACE STREET	SITE NO.	6225
REGION	NORTHERN	MUNICIPALITY	GREATER BENDIGO

GENERAL

Works Program Job?	Yes	Project Number	BG197TS
Classification	SIMPLE	Works Order Number	4A006497
Description	<input type="checkbox"/> New intersection signals <input checked="" type="checkbox"/> New pedestrian operated signals <input type="checkbox"/> Controller swap. Reason for swap		

CONTROLLER DETAILS

Type	QTC	Software Version & Release	V5 R20	Lanterns	LED
Number of Signal Groups	Vehicle	3	Pedestrians	1	Total 4
Number of special outputs / Pedestrian Wait State Outputs					
Controller capacity	4				
Number of detectors	Vehicle	10	Pedestrians	1	Total 11
	Tram		Other		

CONTROLLER APPLICATIONS

Target Date for Draft Opsheet	29/07/19
Target Date for completion of Program	19/08/19

Prepare Interlocking

PERSONALITY CHECKSUMS

	Hex	Octal
Total	C9	311
Times	44	104
Pers	8D	215
Dispatched	22/08/19	

PROGRAM DELIVERY - SIGNAL INSTALLATION

If switch-on of a metro site is to occur without a Telstra line, seek approval of the T/L Signal Services

SCATS connection	Controller must be connected to SCATS at switch-on
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PRIOR NOTICE

A job must be entered into RAI Action database before this switch on will be allowed.

<input checked="" type="checkbox"/>	SCATS data changes - notify	NECATI UYAR	Ext	1327
	OR	DARREN VAUGHAN	Ext	1210
before 3:00pm on the day before switch on.				

SCATS Data Changes - Slot data & graphics

TRAFFIC MANAGEMENT CENTRE

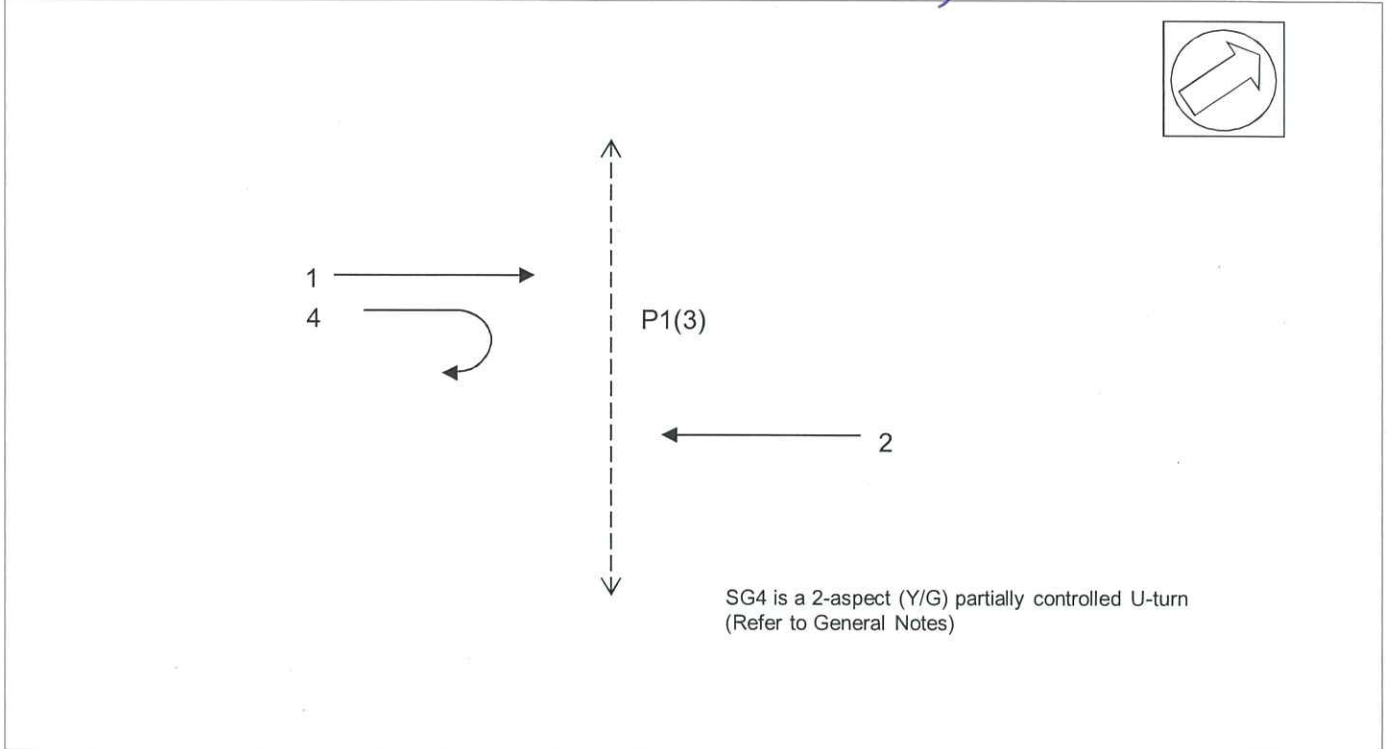
<input checked="" type="checkbox"/>	Please notify NECATI UYAR (x1327) on job completion.
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DATE OF NEW CONTROLLER SWITCH ON

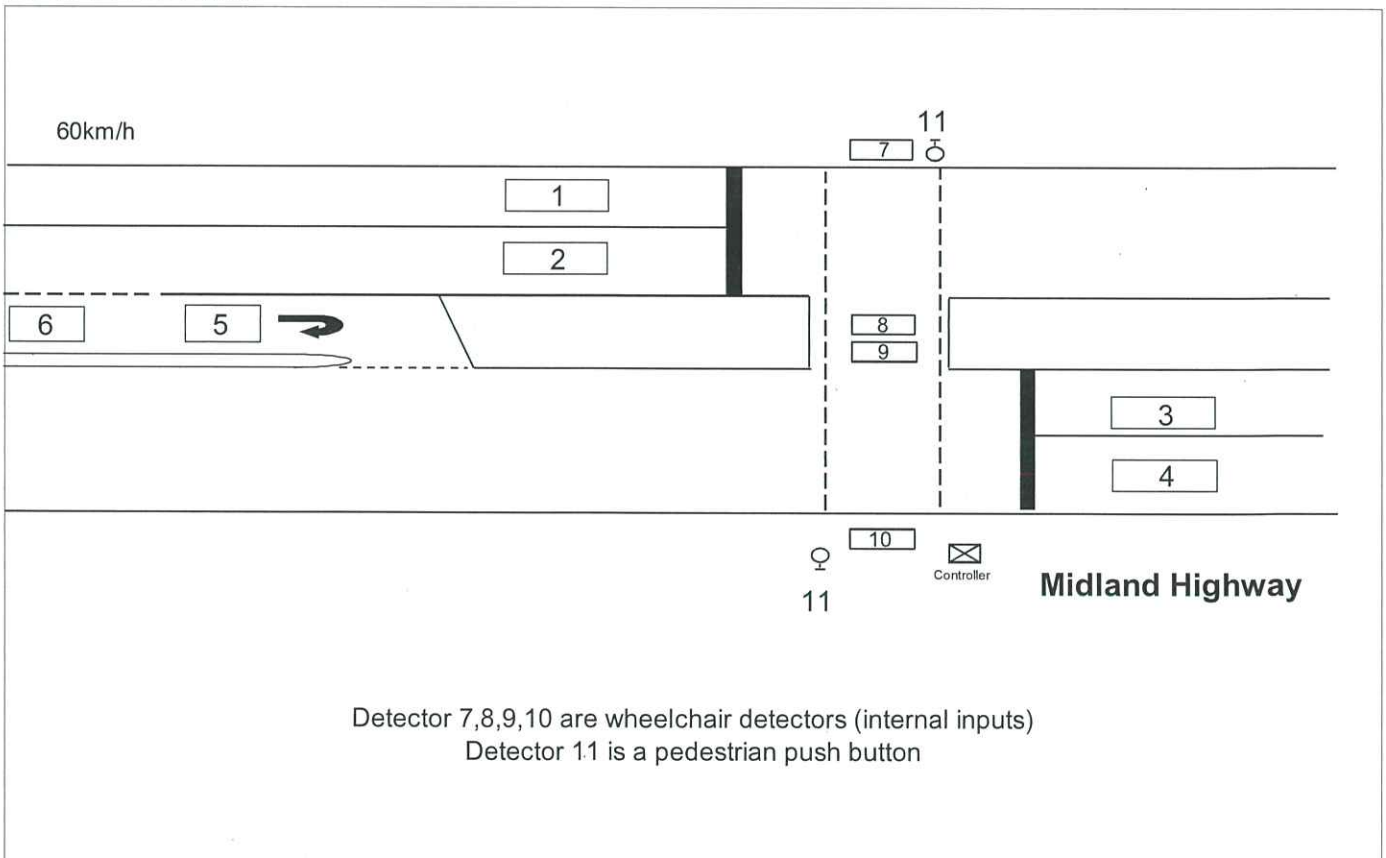
CONTROLLER OPERATION SPECIFICATION

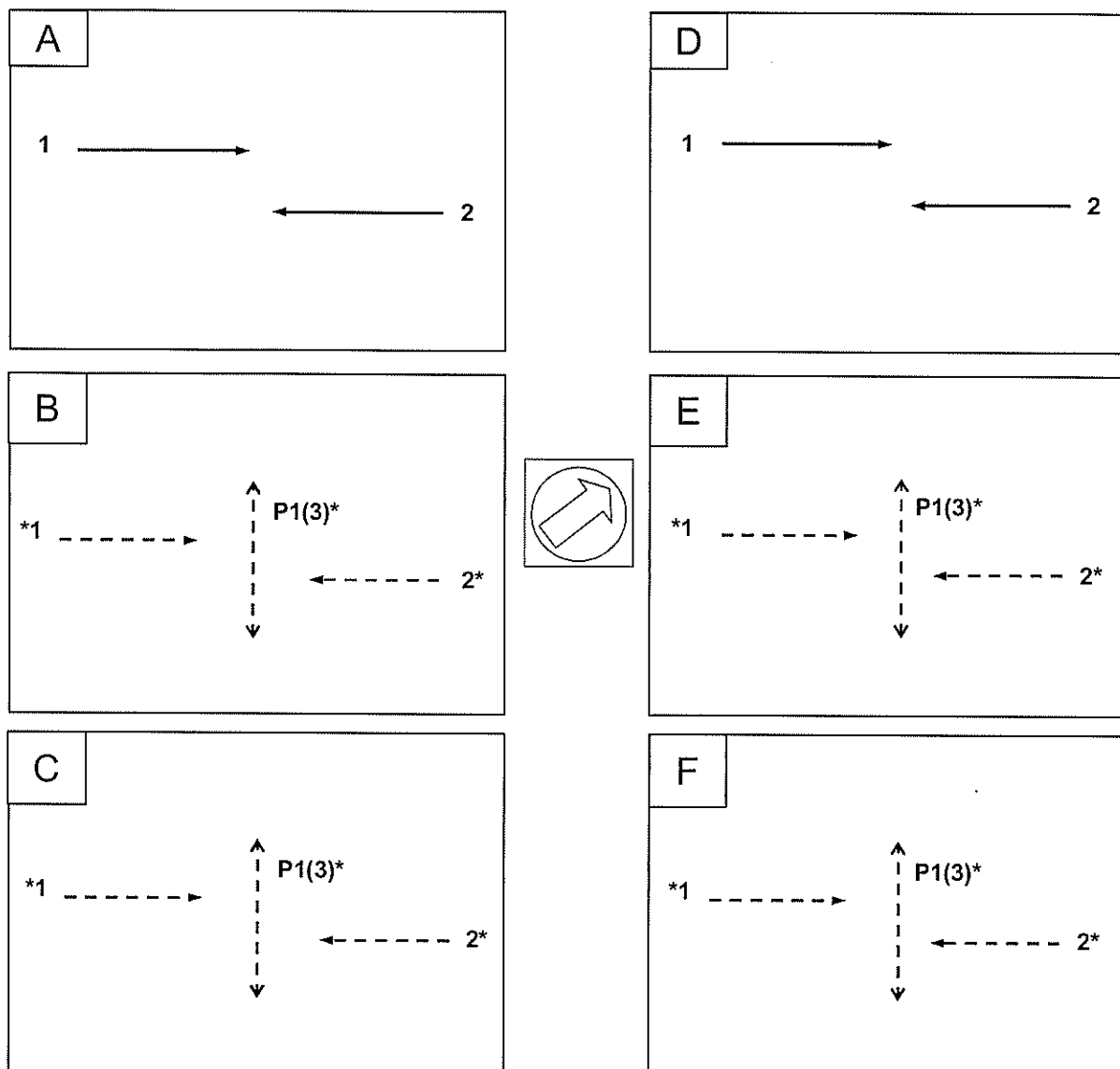
SITE NAME	MIDLAND HIGHWAY NR GRACE STREET		SITE NO.	6225
MUNICIPALITY	GREATER BENDIGO	DESIGNED BY	NECATI UYAR	DATE 24/07/19
PLAN NO.	779566	DESIGN CHECKED		DATE 7/8/19
CONTROLLER TYPE	QTC	PROM CHECKED		DATE 22/8/19

GROUP ALLOCATION



DETECTOR MAP



PHASING DIAGRAM**OPERATION IN LINK MODE**

1. Signal groups are independent of phasing. All phases have a permanent demand in Masterlink & Flexilink
2. SG1 & SG2 cannot close down during AØ (refer note 6 below for the exception).
- * 3. SG1 & SG2 can close down at any time during BØ green, provided SG1 & SG2 minimum green has expired and both approaches gap or waste. If SG1 & SG2 close down at the end of BØ green (i.e. at the start of BØ yellow), P1 introduces at the start of CØ
- * 4. SG1 & SG2 cannot close down during CØ
5. Any ped demand placed during BØ intergreen or during CØ will not be serviced until the next cycle.
6. If BØ is left out of the sequence in Masterlink or Flexilink, SG1 & SG2 can close down at the start of AØ yellow and P1 introduces at the start of CØ.
7. The operation of DØ, EØ, FØ are the same as for AØ, BØ, CØ respectively. DØ, EØ and FØ are only used when double phasing.
8. When XSF3 (Master & Flexi) is set, P1 uses Special Purpose Timesetting No. 9 for its walk time.

OPERATION IN V.A. AND FLEXI ISOLATED MODES

1. Controller runs AØ and CØ.
2. AØ is extended by the vehicle detectors. When AØ gaps or wastes, AØ and SG1 & SG2 close down together.
3. CØ is called by P1. P1 introduces at the start of CØ (SG1 & SG2 close down at the start of AØ yellow). CØ runs for the duration of P1 walk, clearance and solid don't walk time.

V.A. SEQUENCE AC

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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	I	1	Extend SG1, Approach 1 *	0			✓		
2	I	2	Extend SG1, Approach 1 *	0			✓		
3	I	3	Extend SG2, Approach 2 *	0			✓		
4	I	4	Extend SG2, Approach 2 *	0			✓		
5	I	5	U-turn loop. Call P2. Refer page 3/1.	0		✓			
6	I	6	U-turn loop. Call P2. Refer page 3/1.	0		✓			
7	I	7	Call Ped 1# (Wheelchair loop)	0		✓			
8	I	8	Call Ped 1# (Wheelchair loop)	0		✓			
9	I	9	Call Ped 1# (Wheelchair loop)	0		✓			
10	I	10	Call Ped 1# (Wheelchair loop)	0		✓			
11	E	1	Call CØ. Places demand for Ped 1**.	6		✓			
12									
13									
14									
15									

* For Queuing Feature, refer notes on page 6.

Detectors 7, 8, 9 & 10 place locking calls for P1 when their presence time expires, substituting SPT No.12 for P1 walk.

If ON continuously then do no recall P1 (from dets 7 &/or 8 &/or 9 &/or 10) until they change state from OFF to ON.

** MSS11 is set for the duration of P1 demand. MSS12 is set for the duration of P1 demand from wheelchair detectors 7-10.

INTERGREEN AND PEDESTRIAN TIMES

INTERGREEN TIMES

	LEGAL SPEED	DESIGN SPEED		INTERGREEN		
		YELLOW	RED	YELLOW	RED	TOTAL
SG1 & SG2	60	60	-	4.0	2.0	6.0

PEDESTRIAN TIMES

	WALK			CLEARANCE			MINIMUM SOLID DON'T WALK
	DISTANCE (m)	TIME		DISTANCE (m)	TIME		
		GRAPH	ADOPTED		GRAPH	ADOPTED	
P1	13.5	13	13	8.5	6	6	3.5
P2	6.0	7	7	6.0	4	4	3.5

GENERAL NOTES**SUMMARY OF XSF FLAGS**

(Communications Operation of XSF flags is required)

- XSF3 - When set, P1 uses Special Purpose Timesetting No.9 for its walk (Master & Flexi).
XSF5 - Allow detector 5 to place a non-locking call for P2 (All modes).

SIGNAL GROUP OPERATION**Signal Group 1**

1. SG1 closes down when P1 is demanded.
2. SG1 stays green when only P2 is demanded.

Signal Group 2

1. SG2 closes down when P1 or P2 is demanded.

Signal Group 4

1. SG4 is a special movement that uses CØ special all red for its yellow and BØ special all red for its red time (1.5 seconds).
2. SG4 green introduces at the start of P1 walk and terminates at the start of P1 clearance 2, except when XSF14 is set.
3. SG4 green introduces at the start of P2 walk and terminates at the start of P2 clearance 2 when only P2 is demanded.

PEDESTRIAN GROUP OPERATION**Pedestrian 1**

3.5 seconds of solid don't walk is provided at the end of P1 clearance.

Pedestrian 2

Demands for P2 are ignored when P1 is demanded.

The operation of P2 is the same as for P1.

3.5 seconds of solid don't walk is provided at the end of P2 clearance.

DETECTOR OPERATION**Detector 5**

Detector 5 places a non-locking call for 'dummy' pedestrian movement P2(5) when its presence timer has expired and XSF5 is set.

If detector 5 is ON for the time in Special Purpose Timesetting No. 13, ignore the call function associated with detector 5 until the detector changes state from OFF to ON.

Detector 6

Detector 6 places a non-locking call for 'dummy' pedestrian movement P2(5) when its presence timer expires.

If detector 6 is ON for the time in Special Purpose Timesetting No. 13, ignore the call function associated with detector 6 until the detector changes state from OFF to ON.

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	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	4.0	4.0	4.5	4.0	4.0	4.5	-
ALL RED (2)	9	2.0	2.0	0.0	2.0	2.0	0.0	-
SPECIAL ALL RED	10	0*	1.5	3.0	-	-	-	-
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	-	-	-	-	-	-	-

1. For SG1 & SG2 minimum green in Isolated mode, refer Special Purpose Timesetting 10.

* Special all red for AØ → BØ, DØ → EØ.

For SG1 & SG2 minimum green in link mode, refer Special Purpose Timesetting 11.

2. When SG1 & SG2 close down they use the phase yellow time & the all-red specified in Special Movement Timesettings 1&2 (AØ all-red).

3. SG1 & SG2 use the gap, headway and waste times specified in AØ timesettings.

4. AØ maximum extension green is used only in Isolated 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	13	7	-	-	-	-	-	-
CLEARANCE 1	3	5	3	-	-	-	-	-	-
CLEARANCE 2	4	1	1	-	-	-	-	-	-

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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 AØ ALL RED)
2	2.0	SG2 ALL RED (SUBSTITUTE AØ ALL RED)
3	1.5	SG4 ALL RED (SUBSTITUTE BØ SPECIAL ALL RED)
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	13	P1 WALK TIME SUBSTITUTION
10	10	SG1 & SG2 MINIMUM GREEN IN ISOLATED MODE
11	10	SG1 & SG2 MINIMUM GREEN IN LINK MODE
12	16	P1 WALK TIME SUBSTITUTION (DETECTORS 7-10)
13	150	Ignore detectors 5 and 6 if ON for more than this time
14		
15		
16		
17		
18	0	LIMIT GREEN WATCHDOG TIMER
19	0	SPECIAL FACILITY CONTROLS ALARM TIMER
20		
21		
22		
23		
24		
25		
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39		
40		

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: 0-20)
1	6.0
2	6.0
3	6.0
4	6.0
5	5.0
6	3.0
7	3.0
8	3.0
9	3.0
10	3.0
11	
12	

QUEUEING FEATURE

APPROACH 1:

- If XSF9 (Masterlink) or R- (Flexilink) is set, and the presence time for detector 1 and/or detector 2 is expired in BØ, and there is a demand for P1, expire approach 1
- If XSF9 (Masterlink) or Q- (Flexilink) is set, and the presence time for detector 1 and/or detector 2 is expired in EØ, 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 3 and/or detector 4 is expired in BØ, and there is a demand for P1, expire approach
- If XSF10 (Masterlink) or Q+ (Flexilink) is set, and the presence time for detector 3 and/or detector 4 is expired in EØ, and there is a demand for P1, expire approach

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+)	ABCDEF (Only ABC run)
2 (Y+)	ABCDEF

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	No	No
E	No	No
F	No	No
G	No	No

PHASE SEQUENCE 2		
PHASE	LOOK AHEAD*	RELEASE
A	No	No
B	No	No
C	No	No
D	No	No
E	No	No
F	No	No
G	No	No

* 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, E

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	Double phasing, i.e. Run ABCDEF
Z- Flexi	
Z- Master	
Z+ Flexi	
Z+ Master	
R- Flexi	Queuing Feature (refer notes on page 6)
R+ Flexi	Queuing Feature (refer notes on page 6)
Q- Flexi	Queuing Feature (refer notes on page 6)
Q+ Flexi	Queuing Feature (refer notes on page 6)

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>	=	6	,	1	,	0
		(phases)		(split plans)		(walks)
INT	=	6225				
VC	=	5				
CS	=					
COM	=	NET				
PK	=	!				
S#	=					
LM	=					
RMN	=	0				
DCL	=	0				
AT	=	4				
BT	=	6				
CT	=	5				
DT	=	4				
ET	=	6				
FT	=	5				
PP1	=	0,0A				
PP2	=	0,0A				
PP3	=	0,0A				
PP4	=	0,0A				

TYPICAL SPLIT PLAN DATA

PHASE SEQUENCE 1	
A =	0PDB
B =	50NGC
C* =	23#NGA
D =	1E
E =	1F
F =	1A

PED NO	PED NO				P1	
	GROUP NO		1	2	3	4
	1				X	
	2				X	X
P1	3	X	X			
	4			X		

* DUMMY P2 CONFLICTS WITH SG2

* CØ = WALK + CLEARANCE + 3 SECONDS

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 =			