

		ACTION	DATE
TO	1. SENIOR ENGINEER, CONTROLLER APPLICATIONS		
	2. STEVE BELZ, PROGRAM DELIVERY		
FROM	NATHAN CORCORAN	DATE	6/05/19
SITE	MIDLAND HIGHWAY / POWELL STREET	SITE NO.	6292
REGION	RRV - NORTHERN	MUNICIPALITY	GREATER BENDIGO

GENERAL

Works Program Job?	No	Project Number	BG197TS
Classification	MINOR	Works Order Number	4A006297

EXISTING CONTROLLER DETAILS

Type	PSC 2003	Software Version & Release	V5R81	Lanterns	LED
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CONTROLLER APPLICATIONS

Target Date for Draft Opsheet	09/05/19
Target Date for completion of Program	23/05/19

Prepare Interlocking

PERSONALITY CHECKSUMS

	Hex	Octal
Total	9C	234
Times	CE	316
Pers	52	122

Dispatched 23/05/19

Update Graphics, Site Notes No

☐ Site ID Revision updated to

Description of changes Changes to detector functions for addition of P1 wheelchair loops

PROGRAM DELIVERY - SIGNAL INSTALLATION

<input type="checkbox"/> Changes to signal hardware	<input type="checkbox"/> Changes to interlocking
<input checked="" type="checkbox"/> Additional detectors (WHEELCHAIR)	<input checked="" 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 - Checksum Update Only

TRAFFIC MANAGEMENT CENTRE

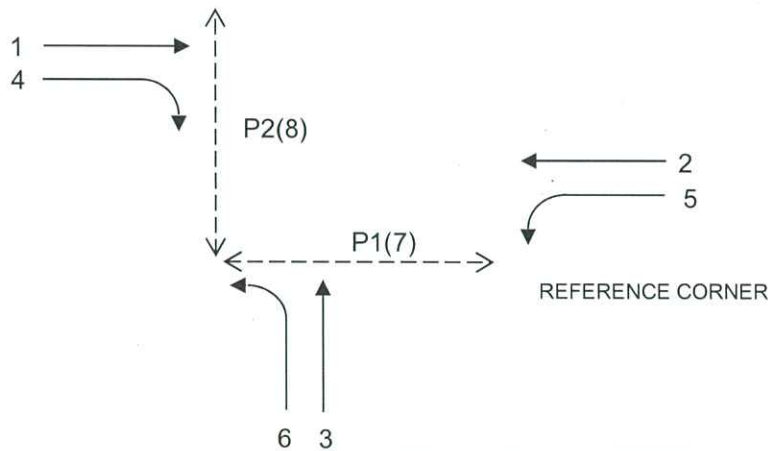
<input checked="" type="checkbox"/> Checksum update only
<input type="checkbox"/> Changes to trim or manual intervention features required
<input checked="" type="checkbox"/> Please notify Nathan Corcoran (x1210) on job completion.

DATE PROM INSTALLED

CONTROLLER OPERATION SPECIFICATION

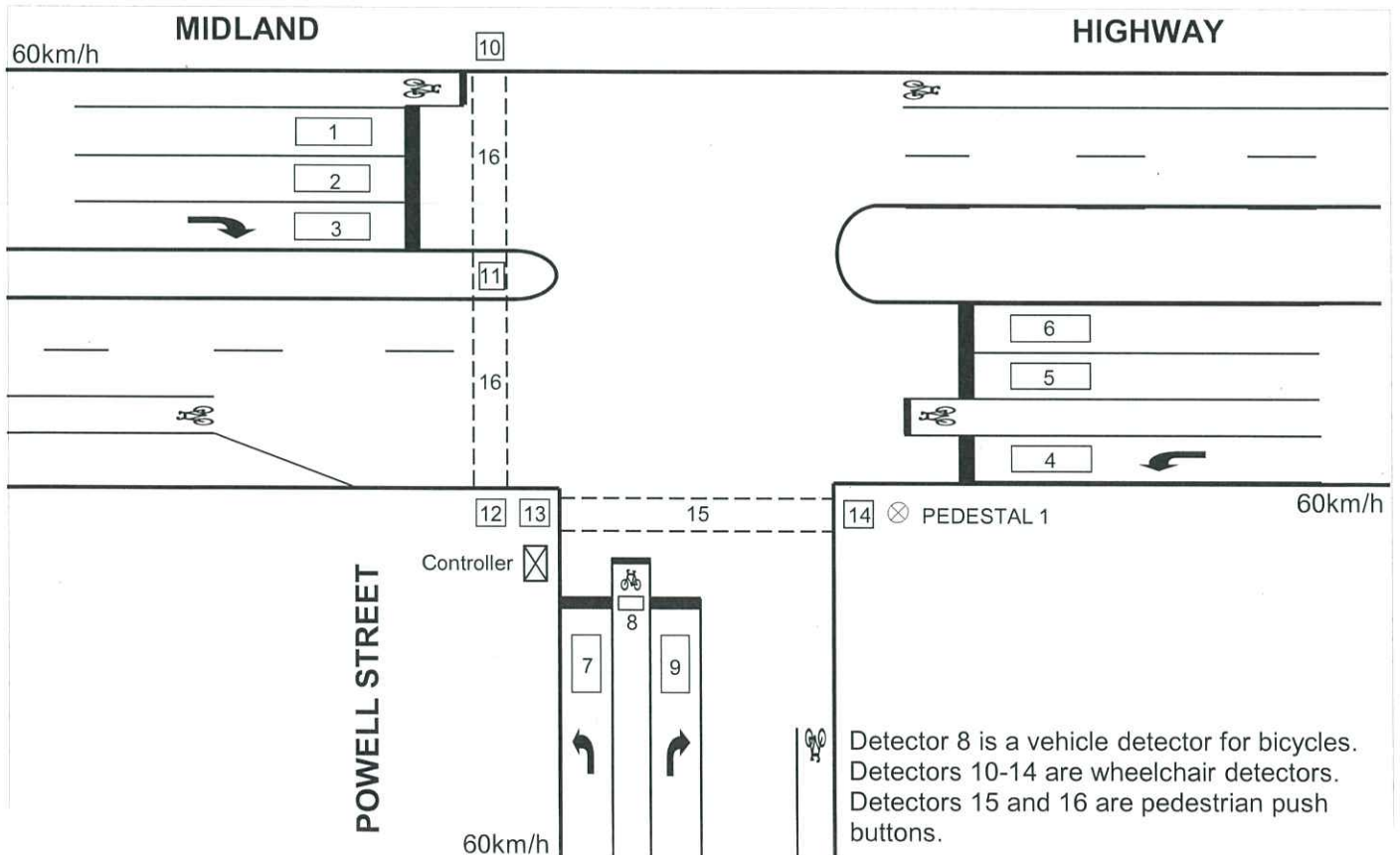
SITE NAME	MIDLAND HIGHWAY / POWELL STREET			SITE NO.	6292
MUNICIPALITY	GREATER BENDIGO	DESIGNED BY	NATHAN CORCORAN	DATE	6/05/19
PLAN NO.	779565	DESIGN CHECKED	<i>Nathan Corcoran</i>	DATE	10/5/19
CONTROLLER TYPE	PSC 2003	PROM CHECKED	<i>Nathan Corcoran</i>	DATE	23/5/19

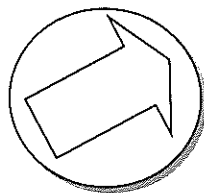
GROUP ALLOCATION



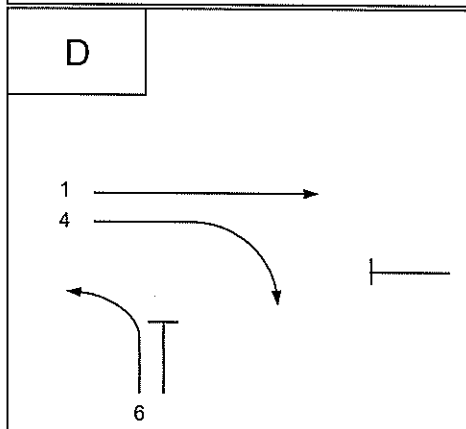
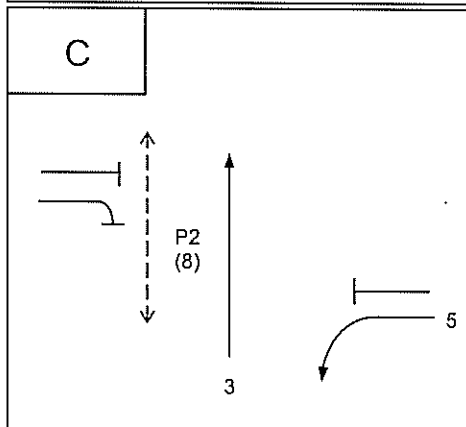
SG4 is a 3-aspect (R/Y/G) partially controlled right turn (conditional red)
SG5 & SG6 are 2-aspect (Y/G) partially controlled left turns.

DETECTOR MAP





* Red arrow drops in AØ.

[illegible]

A C D

DATE 6/05/19

Document ID: 15827415 6292aRNWOpSheet

SITE NAME

MIDLAND HIGHWAY / POWELL STREET

SITE NO.

6292

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		
														Call & Extend	Call Only	Ignore Alarm
1	I	1	A	✓			A,B				0			✓		
2	I	2	A	✓			A,B				0			✓		
3	I	3	A	A	B,D		A,B,D			✓	0		✓	✓		
4	I	4	A	✓			A,C				0		✓	✓		
5	I	5	A	✓			A				0			✓		
6	I	6	A	✓			A				0			✓		
7	I	7	B,D	✓			B,C,D			✓	0		✓	✓		
8	I	8	C	✓							0		✓		✓	
9	I	9	C	✓			C				0		✓	✓		
10	I	10	C		✓				Wheel Chair Loop	✓	0		✓			
11	I	11	C		✓				Wheel Chair Loop	✓	0		✓			
12	I	12	C		✓				Wheel Chair Loop	✓	0		✓			
13	I	13	A		✓				Wheel Chair Loop	✓	0		✓			
14	I	14	A		✓				Wheel Chair Loop	✓	0		✓			
15	E	1	A		✓			P1		✓	6		✓			
16	E	2	C		✓			P2		✓	6		✓			
17																
18																
19																
20																
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
32																

DESIGNED BY: NATHAN CORCORAN

DATE 6/05/19

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, B22	1	AØ↔BØ, AØ→DØ	
2	5, 6	A22	2		
3	3	A33, B11, D11	1, 4	AØ→BØ, AØ→DØ	
4	4	A44, C33	2, 5	AØ↔CØ	
5	7	B33, C22, D22	6, 3	BØ→CØ, CØ→DØ	
6	9	C11	3		
7					
8					
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 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

SIGNAL GROUP OPERATION

Signal Group 3

1. Late start SG3 in CØ when P2 is demanded.

Signal Group 4

1. SG4 operates green-yellow-red in BØ and DØ.
2. SG4 closes down in BØ and remains red during CØ.
3. SG4 closes down at the end of DØ green, remains red through AØ late start, then goes 'blank' at the start of AØ minimum green.
4. SG4 goes red with SG1 in AØ if going AØ→CØ and remains red through CØ. If going CØ→AØ, SG4 remains red through AØ late start, then goes 'blank' at the start of AØ minimum green.

When P1 is demanded.

5. If going CØ→AØ with a demand for P1, hold SG4 red for the duration of Timer 1 (Special Purpose Timesetting No. 14). Timer 1 starts timing at the start of P1 walk. When Timer 1 expires SG4 red is switched off.
6. If going BØ→AØ or DØ→AØ with a demand for P1, SG4 goes red at the start of BØ or DØ all red period, and is held red for the duration of Timer 1 (Special Purpose Timesetting No. 14). Timer 1 starts timing at the start of P1 walk. When Timer 1 expires SG4 red is switched off.
7. AØ ECO is used to guarantee SG4 minimum blank period. Timer 2 (Special Purpose Timesetting No. 15) starts timing at the start of SG4 blank period. When Timer 2 expires, expire AØ ECO.

Signal Group 5

1. Late start SG5 in CØ if going AØ→CØ using a special timer that uses Special Purpose Timesetting No. 13 (2 seconds) and starts at the beginning of CØ.

PEDESTRIAN GROUP OPERATION

Pedestrian 1

1. P1 calls AØ.
2. P1 calls CØ when the controller is resting in AØ.
3. P1 can introduce at the start of AØ.
4. When Z- is set in Master & Flexi, substitute Special Purpose Timesetting No. 9 for P1 walk timesetting.
5. When P1 is called by detectors 13 or 14, Special Purpose Timesetting No. 17 is substituted for P1 walk.
6. When Z- is set in Master and Flexi, and P1 is called by detectors 13 or 14, use Special Purpose Timesetting No. 17 for P1 walk.

Pedestrian 2

1. P2 calls CØ.
2. P2 can introduce at the start of CØ.
3. When Z+ is set in Master & Flexi, substitute Special Purpose Timesetting No. 10 for P2 walk timesetting.
4. When Z+ is set in Master & Flexi, substitute CØ Special All Red (max 15 seconds) for P2 clearance timesetting.

5. When P2 is called by detectors 10, 11 or 12, Special Purpose Timesetting No. 11 is substituted for P2 walk.
6. When Z+ is set in Master and Flexi, and P2 is called by detectors 10, 11 or 12, use Special Purpose Timesetting No. 11 for P2 walk.

PHASE OPERATION

C Phase

1. Expire CØ late start if there is no demand for P2.
2. When Z+ is set in Master and Flexi, substitute Special Purpose Timesetting No. 12 for CØ late start.

DETECTOR OPERATION

General

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

Detector 3

1. Detector 3 places a locking call for AØ
2. Detector 3 places a non-locking call for BØ and DØ when its presence timer has expired.

Detector 7

1. If in AØ with a demand for CØ clear demands for BØ from detector 7.
2. Clear demands for BØ and DØ from detector 7 during SG3 and SG6 green and yellow.

Detector 10

1. Detector 10 is a wheel chair detector.
2. Detector 10 places a locking call for P2 after its presence timer expires.
3. P2 substitutes Special Purpose Timesetting No. 11 for its walk time when called by detector 10.
4. If detector 10 is ON for the time in Special Purpose Timesetting No 16 then do not recall P2 (from detector 10) until detector 10 changes state from OFF to ON.

Detector 11

1. Detector 11 is a wheel chair detector.
2. Detector 11 places a locking call for P2 after its presence timer expires.
3. P2 substitutes Special Purpose Timesetting No. 11 for its walk time when called by detector 11.
4. If detector 11 is ON for the time in Special Purpose Timesetting No 16 then do not recall P2 (from detector 11) until detector 11 changes state from OFF to ON.

Detector 12

1. Detector 12 is a wheel chair detector.
2. Detector 12 places a locking call for P2 after its presence timer expires.
3. P2 substitutes Special Purpose Timesetting No. 11 for its walk time when called by detector 12.
4. If detector 12 is ON for the time in Special Purpose Timesetting No 16 then do not recall P2 (from detector 12) until detector 12 changes state from OFF to ON.

SITE NAME: MIDLAND HIGHWAY / POWELL STREET**Detector 13**

1. Detector 13 is a wheel chair detector.
2. Detector 13 places a locking call for P1 after its presence timer expires.
3. P1 substitutes Special Purpose Timesetting No. 17 for its walk time when called by detector 13.
4. If detector 13 is ON for the time in Special Purpose Timesetting No 16 then do not recall P1 (from detector 13) until detector 13 changes state from OFF to ON.

Detector 14

1. Detector 14 is a wheel chair detector.
2. Detector 14 places a locking call for P1 after its presence timer expires.
3. P1 substitutes Special Purpose Timesetting No. 17 for its walk time when called by detector 14.
4. If detector 14 is ON for the time in Special Purpose Timesetting No 16 then do not recall P1 (from detector 14) until detector 14 changes state from OFF to ON.

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	2 → 4	28.0	60	60	60	4.0	2.0	6.0
B	4 → 3	26.0	60	60	45	4.0	2.0	6.0
C	3 → 1	24.0	60	45	45	3.0	2.0	5.0
D	4 → P1	29.0	60	45	45	3.0	2.5	5.5
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			
A	C	2 → P2	34.5	60	2.0	A AR
B	A	4 → P1	29.0	45	2.5	F AR
		→				
		→				
		→				
		→				

* 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	
1	A	22.0	8	8	22.0	15	15.0	6.0
2	C	14.0	14	14	11.0	7	7.0	5.0

SITE NAME **MIDLAND HIGHWAY / POWELL STREET**SITE NO. **6292****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		3				
MINIMUM GREEN	3	10	6	8	6			
INCREMENT	4							
MAXIMUM INITIAL GREEN*	5							
MAXIMUM EXTENSION GREEN	6	30	0	20	15			
EARLY CUT OFF	7	4.0						
YELLOW	8	4.0	4.0	3.0	3.0			
ALL RED	9	2.0	2.0	2.0	2.5			
SPECIAL ALL RED	10			7.0				
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				
GAP 4	14	2.5						
HEADWAY 1	15	0.6	1.2	1.2	1.2			
HEADWAY 2	16	0.6	0.6	1.2	1.2			
HEADWAY 3	17	1.2	1.2	1.2				
HEADWAY 4	18	1.2						
WASTE 1	19	7	7	7	7			
WASTE 2	20	7	7	7	7			
WASTE 3	21	7	7	7				
WASTE 4	22	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	14.0						
CLEARANCE 1	3	15.0	7.0						
CLEARANCE 2	4								

* Minimum walk time - used in Isolated and Flexilink operation

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

DESIGNED BY: NATHAN CORCORAN

DATE 6/05/19

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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		
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	8	P1 walk time substitution (Flexi Z-)
10	17	P2 walk time substitution (Flexi Z+)
11	17	P2 wheel chair walk time substitution
12	4	CØ late start substitution (Z+)
13	2	SG5 late start in CØ
14	8	Timer 1: duration for holding SG4 red in AØ with P1 demand
15	4	Timer 2: minimum blank period for SG4 in AØ
16	120	Ignore wheel chair detector if ON for this time
17	11	P1 wheel chair walk time substitution
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		

SITE NAME **MIDLAND HIGHWAY / POWELL STREET**SITE NO. **6292****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	
7	
8	
9	
10	3.0
11	3.0
12	3.0
13	3.0
14	3.0
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)	

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SITE NAME **MIDLAND HIGHWAY / POWELL STREET**SITE NO. **6292****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 & RELEASES

PHASE SEQUENCE 1			PHASE SEQUENCE 2		
PHASE	LOOK AHEAD*	RELEASE	PHASE	LOOK AHEAD*	RELEASE
A	No	R-	A		
B	No	R+	B		
C	Yes (to D, A)	Q-	C		
D	Yes (to A)	Q+	D		
E			E		
F			F		
G			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 LENGTHOne 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	P1 WALK TIME SUBSTITUTION
Z- Flexi	
Z- Master	P2 WALK TIME & CLEARANCE AND CØ SUBSTITUTION
Z+ Flexi	
Z+ Master	AØ RELEASE PULSE
R- Flexi	
R+ Flexi	BØ RELEASE PULSE
Q- Flexi	CØ RELEASE PULSE
Q+ Flexi	DØ RELEASE PULSE

DESIGNED BY: **NATHAN CORCORAN**DATE **6/05/19**

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	,	2
		(phases)		(split plans)		(walks)
INT	=			6292		
VC	=			5		
CS	=					
COM	=			NET		
PK	=			!		
S#	=					
LM	=					
RMN	=			0		
DCL	=			0		
AT	=			6		
BT	=			6		
CT	=			5		
DT	=			6		
ET	=					
FT	=					
GT	=					
W1	=	8		W1 T	=	21
W2	=	14		W2 T	=	12
W3	=			W3 T	=	
W4	=			W4 T	=	
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 = 0PDFGB	A = 0PDFGB	A = 0PDFGB
B = 1C	B = 20C	B = 15C
C = 20D	C = 20(TG)D	C = 20(TG)D
D = 20TGA	D = 1A	D = 15TGA

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 =	

SITE NAME **MIDLAND HIGHWAY / POWELL STREET**

SITE NO.

6292

GROUP CONFLICT TABLE

PED NO	PED NO		m		m		m		P1		P2														
	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
m	1			X					X																
	2			X	X		X		X																
	3	X	X		X			X																	
	4		X	X		X		X	X																
	5				X			X																	
	6		X					X	X																
	7			X	X	X	X																		
	P2	8	X	X		X		X																	
	9																								
	10																								
	11																								
	12																								
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	24																								

CHECKED: *Noel Raveendran* DATE: 6/04/19

DESIGNED BY: NATHAN CORCORAN

DATE 6/05/19