

		ACTION	DATE
TO	1. SENIOR ENGINEER, CONTROLLER APPLICATIONS		
	2. STEVE BELZ, PROGRAM DELIVERY		
FROM	NOEL RAVEENDRAN	DATE	17/11/20
SITE	MCIVOR HWY / MITCHELL ST / VIEW ST	SITE NO.	6200
REGION	NORTHERN	MUNICIPALITY	GREATER BENDIGO

## GENERAL

Works Program Job?	Yes	Project Number	DK564C
Classification	MINOR	Works Order Number	4A007272

## EXISTING CONTROLLER DETAILS

Type	ATSC 4	Software Version & Release	V6R20.1	Lanterns	LED
------	--------	----------------------------	---------	----------	-----

## CONTROLLER APPLICATIONS

Target Date for Draft Opsheet	19/11/2020
Target Date for completion of Program	03/12/2020

Prepare Interlocking	
----------------------	--

Update Graphics, Site Notes	No
-----------------------------	----

Description of changes	Timesetting changes for 40 km/h CBD speed zone.
------------------------	---

## PERSONALITY CHECKSUMS

	Hex	Octal
Total	F3	363
Times	81	201
Pers	72	162

Dispatched	3/12/20
------------	---------

<input type="checkbox"/>	Site ID Revision updated to
--------------------------	-----------------------------

## 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	NOEL RAVEENDRAN	Ext	1210
	OR	DARREN VAUGHAN	Ext	1210

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

SCATS Data Changes - Delete RAM data.

## TRAFFIC MANAGEMENT CENTRE

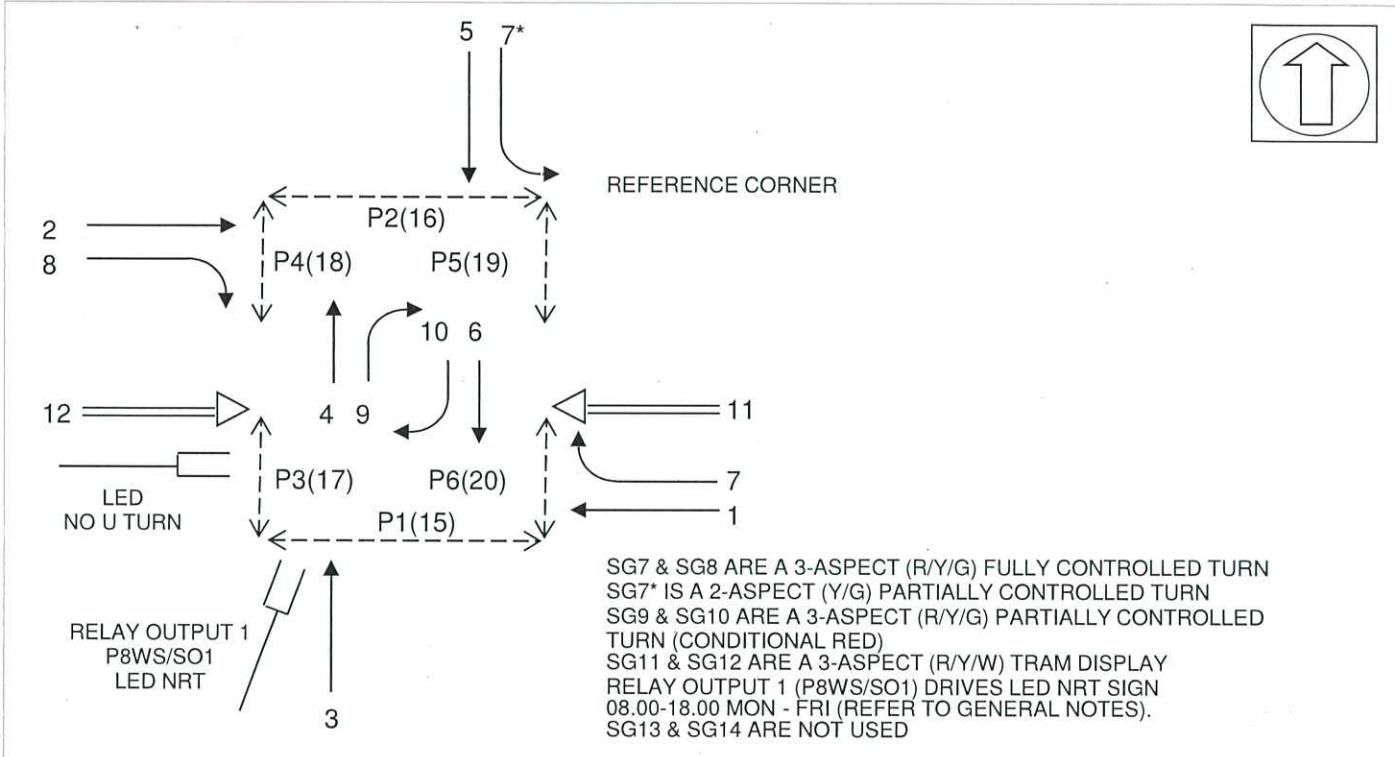
<input type="checkbox"/>	Checksum update only
<input type="checkbox"/>	Changes to trim or manual intervention features required
<input checked="" type="checkbox"/>	Please notify NOEL RAVEENDRAN (x1210) on job completion.

## DATE PROM INSTALLED

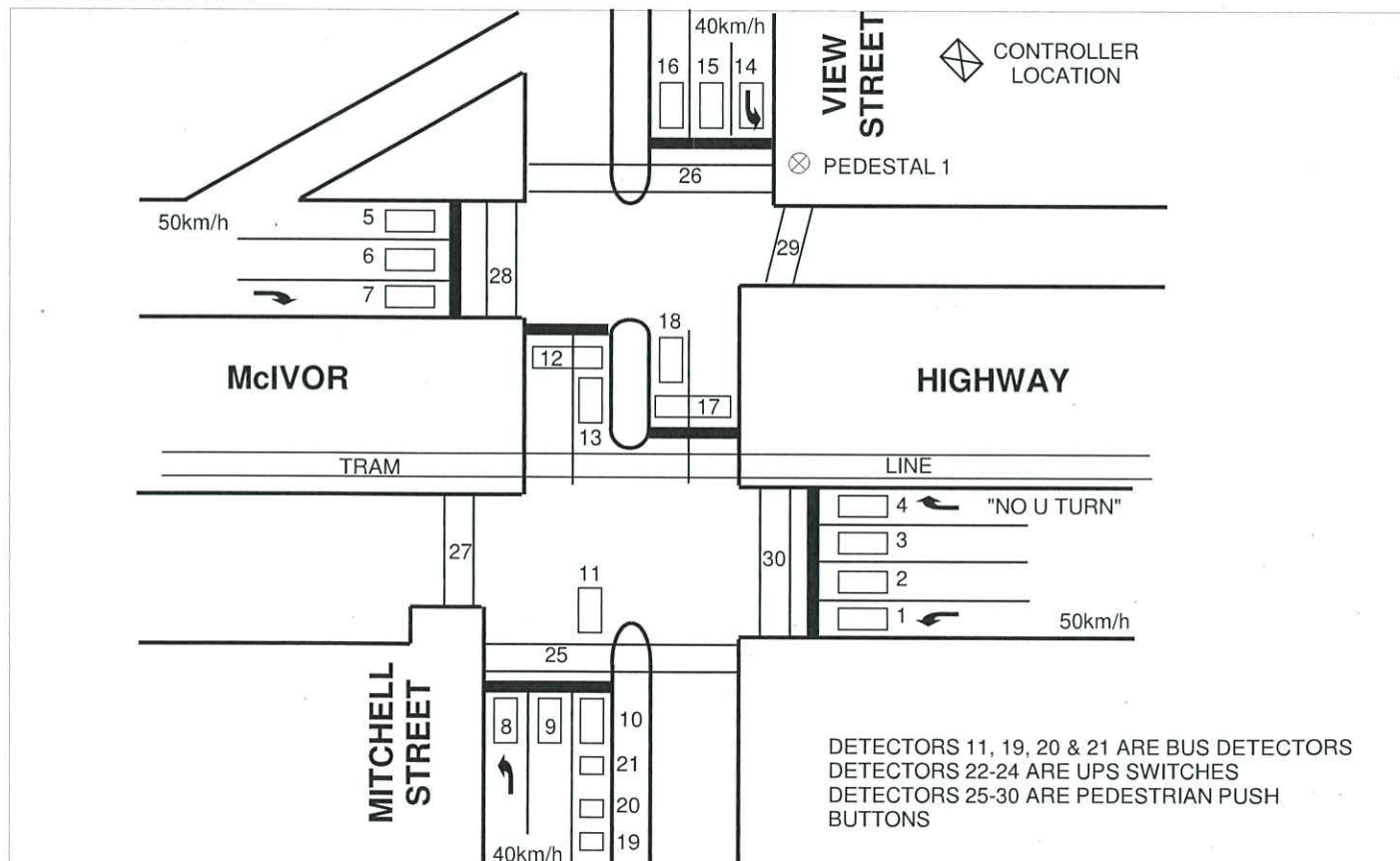
# CONTROLLER OPERATION SPECIFICATION

SITE NAME	<b>MCIVOR HWY / MITCHELL ST / VIEW ST</b>			SITE NO.	<b>6200</b>
MUNICIPALITY	GREATER BENDIGO	DESIGNED BY	NOEL RAVEENDRAN	DATE	17/11/20
PLAN NO.	532466E	DESIGN CHECKED	<i>M. J. Bhele</i>	DATE	23/11/20
CONTROLLER TYPE	ATSC 4	PROM CHECKED	<i>M. S. Raveendran</i>	DATE	3/12/20

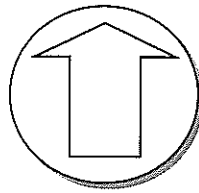
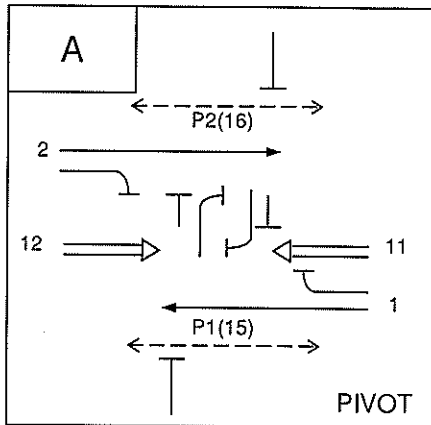
## GROUP ALLOCATION



## DETECTOR MAP

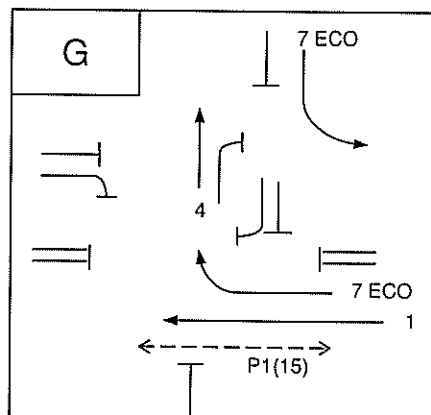
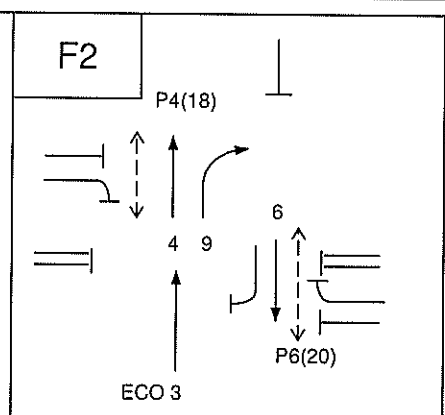
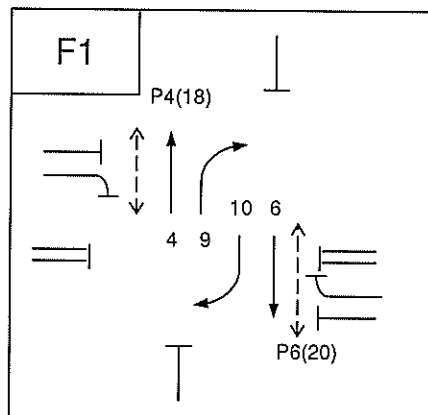
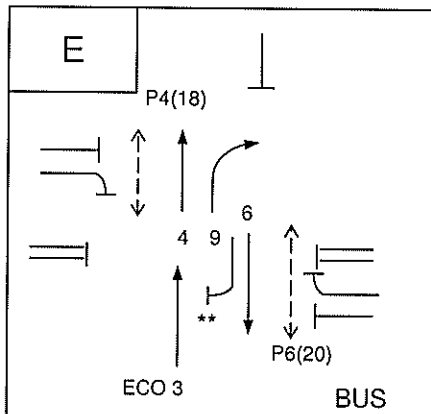
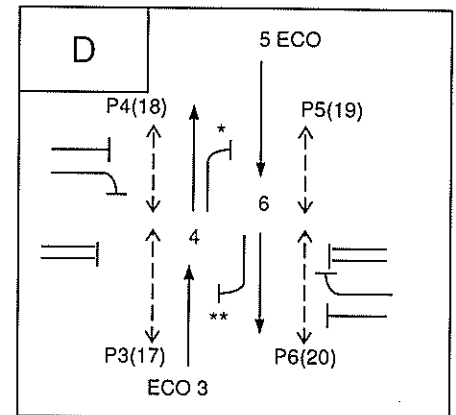
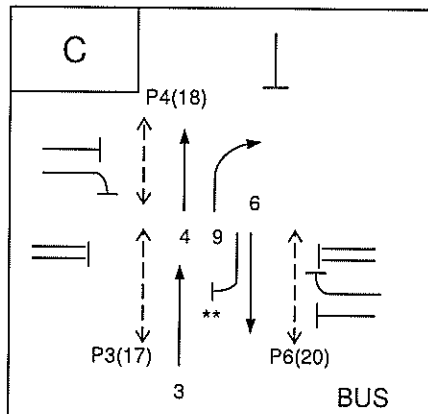
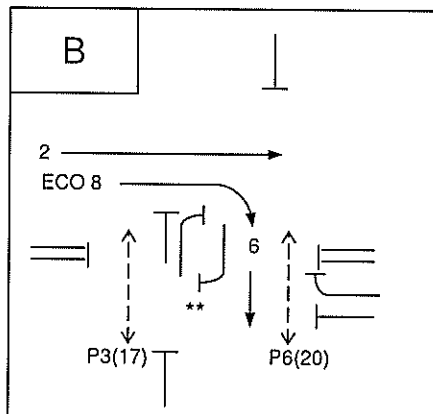


# PHASING DIAGRAM



Refer General Notes

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



\* Conditional on pedestrian demand.  
\*\* Conditional on NRT.

REVn. & V.A. SEQUENCE **ABCDEF**

DESIGNED BY: NOEL RAVEENDRAN

DATE 17/11/20

Document ID: 19629123 6200bRNWOpSheet

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	Refer Special Notes
1	I	1	A	✓			A				0			✓			
2	I	2	A	✓			A				0			✓			
3	I	3	A	✓			A				0			✓			
4	I	4	G	✓			G			✓	0			✓			
5	I	5	A	✓			A,B				0			✓			
6	I	6	A	✓			A,B				0			✓			
7	I	7	B	✓			B			✓	0			✓			
8	I	8	D	✓			D				0			✓			
9	I	9	D	✓			D				0			✓			
10	I	10	CDE	D	CE		C,D,E			✓	0			✓			
11	I	11	E		✓		E		VEH DET FOR BUSES	✓	0					✓	
12	I	12	D	✓						✓	0				✓		
13	I	13	F		✓		F			✓	0			✓			
14	I	14	D	✓			D,G			✓	0			✓			
15	I	15	D	✓			D				0			✓			
16	I	16	D	✓			D			✓	0			✓			
17	I	17	D	✓						✓	0				✓		
18	I	18	F		✓		F			✓	0			✓			
19	I	19	-						VEH DET FOR BUSES	✓	0					✓	
20	I	20	CE	✓			C,E		VEH DET FOR BUSES	✓	0					✓	
21	I	21	-						VEH DET FOR BUSES	✓	0					✓	
22	E	7	-		✓				UPS mains failure (OFF)	✓	0		✓				
23	E	8	-		✓				UPS Battery Low (OFF)	✓	0		✓				
24	E	9	-		✓				UPS Fault (ON)	✓	1	✓					
25	E	1	A		✓			P1		✓	6		✓				
26	E	2	A		✓			P2		✓	6		✓				
27	E	3	D		✓			P3		✓	6		✓				
28	E	4	D		✓			P4		✓	6		✓				
29	E	5	D		✓			P5		✓	6		✓				
30	E	6	D		✓			P6		✓	6		✓				
31																	
32																	

DESIGNED BY: NOEL RAVEENDRAN

DATE 17/11/20

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		
33																
34																
35																
36																
37																
38																
39																
40																
41																
42																
43																
44																
45																
46																
47																
48																
49																
50																
51																
52																
53																
54																
55																
56																
57																
58																
59																
60																
61																
62																
63																
64																

DESIGNED BY: NOEL RAVEENDRAN

DATE 17/11/20

**APPROACH DEFINITIONS****PHASE APPROACHES**

Approach No	EXTENDING DETECTORS	APPROACH TIMER AND TIMESETTING DEFINITION*	SIGNAL GROUP	APPROACH EXPIRY (EXPAP)	Refer Special Notes
1	1, 2, 3	A11	1		
2	5, 6	A22, B22	2	AØ↔BØ	
3	7	B11	8		
4	Timer 1 Expired Bus on Det10	C11, E11	3		
5	8, 9	D11	3		
6	10	D22	3		
7	15	D33	5		
8	16	D44	5		
9	11	E22	3		
10	13	F11	9		
11	18	F22	10		
12	4	G11	7		
13	14	D53, G22	5, 7		
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					

**APPROACH DEFINITIONS****PHASE APPROACHES**

Approach No	EXTENDING DETECTORS	APPROACH TIMER AND TIMESETTING DEFINITION*	SIGNAL GROUP	APPROACH EXPIRY (EXPAP)	Refer Special Notes
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

\* 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.

## GENERAL NOTES

### SUMMARY OF XSF FLAGS

- XSF1 – Allows P5 to call P6 and P6 to call P5 (Master & Flexi).
- XSF2 – Allows the late introduction of P2 in AØ (Master).
- XSF3 – Inhibits calls for CØ from bus detectors (All modes).
- XSF4 – Bus calls are cancelled and Timers reset after two cycles (All modes).
- XSF5 – Inhibits calls for EØ from bus detectors (All modes).
- XSF6 – Turn on Relay Output 1 to drive LEDNRT (Online).

### SUMMARY OF MSS FLAGS

- MSS1 - Set by a bus demand on detectors 19 & 20.
- MSS2 - Set by a bus demand on detectors 21 & 10.
- MSS3 - Set when Timer 2 expired.
- MSS4 - Set when detector 11 demands EØ.
- MSS10 - When detector 22 changes to ON state set MSS10 (UPS 'Mains Failure')
- MSS11 - When detector 23 changes to ON state set MSS11 (UPS 'Battery Low Warning')
- MSS12 - When detector 24 changes to OFF state set MSS12 (UPS 'Malfunction')

### GENERAL OPERATION

1. If in AØ, BØ, CØ, FØ or GØ clear demands for EØ.
2. If in AØ, BØ, CØ or GØ clear demands for FØ.
3. If in CØ place a demand for DØ.
4. If in EØ clear demands for CØ.
5. REVn – first scan after start-up demands BØ, DØ, FØ and GØ.

### SIGNAL GROUP OPERATION

#### **Signal Group 3**

1. SG3 green overlaps CØ→DØ→EØ→F2Ø.
2. SG3 closes down at the start of DØ ECO if going DØ→GØ or DØ→AØ.
3. SG3 closes down at the start of EØ ECO if going EØ→GØ or EØ→AØ.
4. SG3 closes down at the start of FØ ECO if going F2Ø→GØ or F2Ø→AØ.

#### **Signal Group 4**

1. SG4 green overlaps CØ→DØ→EØ→FØ.
2. SG4 closes down with the phase when going DØ→GØ, EØ→GØ and FØ→GØ. **(Do not overlap).**
3. Late start SG4 in GØ.

#### **Signal Group 5**

1. SG5 closes down at the start of DØ ECO if going DØ→GØ or DØ→AØ.

#### **Signal Group 6**

1. Late start SG6 in BØ.
2. SG6 green overlaps BØ→CØ→DØ→EØ→FØ.

#### **Signal Group 7**

1. SG7 closes down at the start of GØ ECO.

#### **Signal Group 8**

1. SG8 closes down at the start of BØ ECO if going BØ→GØ or BØ→AØ.



### Signal Group 9

1. SG9 operates green-yellow-red in CØ.
2. SG9 operates green-yellow-red in EØ and FØ if going EØ→GØ, EØ→AØ, FØ→GØ and FØ→AØ.
3. SG9 goes red with SG4 in DØ if going DØ→AØ or DØ→GØ and remains red through AØ, BØ and GØ.
4. SG9 closes down at the end of CØ green, remains red through DØ late start, then goes 'blank' at the start of DØ minimum green.
5. SG9 green overlaps EØ→FØ.

When P5 is demanded.

6. If going AØ→DØ or BØ→DØ, with a demand for P5, hold SG9 red for the duration of Timer 3 (Special Purpose Timesetting no. 16). Timer 3 starts timing at the start of P5 walk. When Timer 3 expires, SG9 red is switched off.
7. If going CØ→DØ, with a demand for P5, SG9 goes red at the start of CØ all red period, and is held red for the duration of Timer 3 (Special Purpose Timesetting No.16). Timer 3 starts timing at the start of P5 walk. When Timer 3 expires SG9 red is switched off.
8. DØ ECO is used to guarantee SG9 minimum blank period. **(Ensure DØ ECO does not go below 3 seconds)**

### Signal Group 10

1. SG10 operates green-yellow-red in F1Ø.
2. SG10 goes red with SG6 in BØ if going BØ→GØ or BØ→AØ and remains red through AØ and GØ.
4. SG10 goes red with SG6 in DØ if going DØ→GØ or DØ→AØ.
5. SG10 goes red with SG6 in EØ if going EØ→GØ or EØ→AØ.
6. SG10 closes down at the end of F1Ø green, remains red through GØ, AØ, BØ late start, CØ late start (if from AØ) or DØ late start (if from AØ), then goes 'blank' at the start of BØ minimum green, CØ minimum green (if from AØ) or DØ minimum green (if from AØ).
7. SG10 stays blank if going BØ→CØ→DØ→EØ when Relay Output 1 is not set.
8. SG10 stays red in all phases when Relay Output 1 is set.

## PEDESTRIAN GROUP OPERATION

### Pedestrian 1

P1 calls AØ.

P1 can introduce at any time in GØ and at the start of AØ and can overlap GØ→AØ.

In Master and Flexi, P1 will auto introduce in AØ and GØ while Z- flag is set.

In Flexi, if Q+ flag is set, select Special Purpose Timesetting no.9 for P1 walk time.

### Pedestrian 2

P2 calls AØ.

P2 can introduce at the start of AØ.

In Master, P2 can introduce at anytime in AØ while XSF2 is set.

In Master and Flexi, P2 will auto introduce in AØ while Z- flag is set.

In Flexi, if Q+ flag is set, select Special Purpose Timesetting no.10 for P2 walk time.

### Pedestrian 3

P3 calls DØ.

P3 calls P4.

P3 can introduce at anytime in BØ and CØ and at the start of DØ, and can overlap BØ→CØ, BØ→DØ or CØ→DØ.

In Master and Flexi, P3 will auto introduce in BØ, CØ and DØ while Z+ flag is set.

In Flexi, if Q+ flag is set, select Special Purpose Timesetting no.11 for P3 walk time.

**SITE NAME: McIVOR HWY / MITCHELL ST / VIEW ST**

**Pedestrian 4**

P4 calls DØ.

P4 calls P3.

P4 is hidden in CØ.

P4 can introduce at anytime in CØ and at the start of DØ, and can overlap CØ→DØ, DØ→EØ or DØ→FØ.

In Master and Flexi, P4 will auto introduce in CØ and DØ while Z+ flag is set.

In Flexi, if Q+ flag is set, select Special Purpose Timesetting no.12 for P4 walk time.

**Pedestrian 5**

P5 calls DØ.

When XSF1 is set, P5 calls P6.

P5 can introduce at the start of DØ.

In Master and Flexi, P5 will auto introduce in DØ while Y- (Master) and Y+ (Flexi) flag is set.

In Flexi, if Q+ flag is set, select Special Purpose Timesetting no.13 for P5 walk time.

**Pedestrian 6**

P6 calls DØ.

When XSF1 is set, P6 calls P5.

P6 is hidden in BØ and CØ.

P6 can introduce at anytime in BØ and CØ and at the start of DØ, and can overlap BØ→CØ, BØ→DØ, CØ→DØ, DØ→EØ, DØ→FØ or EØ→FØ.

In Master and Flexi, P6 will auto introduce in BØ, CØ or DØ while Z+ flag is set.

In Flexi, if Q+ flag is set, select Special Purpose Timesetting no.21 for P6 walk time.

**PHASE OPERATION**

**B Phase**

1. Expire BØ ECO if going BØ→CØ, or BØ→DØ.

**D Phase**

1. Expire DØ ECO if going DØ→EØ or DØ→FØ.

**E Phase**

1. Expire EØ ECO if going EØ→FØ.

**F Phase**

1. Expire FØ ECO in F1Ø.

2. Expire FØ minimum green if going EØ→F2Ø.

**DETECTOR OPERATION**

**General**

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

**Detector 4**

1. Clear demands for GØ from detector 4 during SG7 green and yellow.

**Detector 7**

1. Clear demands for BØ from detector 7 during SG8 green and yellow.

**Detector 10**

1. If the presence timer (Special Purpose Timesetting no. 17) for detector 10 expires during DØ extension, expire DØ extension by detector 10.

#### Detector 12

1. Clear demands for DØ from detector 12 during SG4 green and yellow.

#### Detector 13

1. Detector 13 places a non-locking call for FØ when its presence time expires.

#### Detector 14

1. Clear demands for DØ from detector 14 during SG5 and SG7 green and yellow.

#### Detector 16

1. If the presence timer for detector 16 expires during DØ extension, expire DØ extension by detector 16.

#### Detector 17

1. Clear demands for DØ from detector 17 during SG6 green and yellow.

#### Detector 18

1. Detector 18 places a non-locking call for FØ when its presence time expires.
2. Clear demands for FØ from detector 18 when Relay Output 1 is set.

#### Detectors 10, 11, 19, 20 & 21 (Bus Operation)

1. Detectors 19 & 20 - if detector 19 is activated prior to detector 20 and detector 19 remains on during the period between detector 19 being activated and detector 20 being activated, and detector 20 is occupied for the duration of the presence time, then start Timer 1 (Special Purpose Timesetting No.14) and set MSS1. When Timer 1 expires place locking calls for CØ and EØ and extend CØ and EØ.
2. Detectors 21 & 10 - if detector 21 is activated prior to detector 10 and detector 21 remains on during the period between detector 21 being activated and detector 10 being activated, and detector 10 is occupied for the duration of the presence time, then reset Timer 1 cancelling the calls for CØ and EØ, set MSS2, start Timer 2 (Special Purpose Timesetting No. 15). Timer 2 expired, place non-locking calls for CØ and EØ and set MSS3.
3. Detector 11 places a non locking call for EØ and extends EØ if there is a demand for EØ from detector 10 when detector 11 is activated. Set MSS4 while detector 11 demands EØ.
4. If detector 19 and/or 20 is ON continuously, Timer 1 is not reset until detector 19 and/or 20 changes state from OFF to ON.

If detector 21 and/or 10 is ON continuously, CØ or EØ will not be recalled via detectors 21 and 10 until detector 21 and/or 10 changes state from OFF to ON.

If detector 11 is ON continuously, EØ will not be recalled via detector 11 until detector 11 changes state from OFF to ON.

5. Inhibit calls for CØ from bus detectors when XSF3 is set.  
Inhibit calls for EØ from bus detectors when XSF5 is set.
6. Timer status for the bus calls can be monitored by observing the LED display on the front panel as follows:

Controller	Key Command	Led Position & Timer Nos.
Alpha16	A.128	0 0 0 0 0 0 0 0 4 3 2 1
PSC2000	A.E0128	1 2 3 4

**SITE NAME: McIVOR HWY / MITCHELL ST / VIEW ST**

7. Bus calls are cancelled and timers reset if the timers have been expired for more than one cycle.  
Bus calls are cancelled and timers reset if the timers have been expired for more than two cycles if XSF4 is set.
8. To monitor XSF and MSS flags on the front panel, key in:

	Alpha16	PSC2000	SCATS
XSF flags	A.D8	A.E00D8	MH1;D8
MSS flags	A.DA	A.E00DA	MH1;DA

**OPERATION OF ILLUMINATED SIGNS**

Relay Output 1 drives an LED No Right Turn sign (Northwest → Southwest) from 08:00–18:00 Monday to Friday.

Relay Output 1 is set and cleared in AØ.

When Relay Output 1 is set, inhibit F1Ø and runs F2Ø. F2Ø only runs when Relay Output 1 is set. F1Ø runs at all other times.

When Relay Output 1 is set, do not switch off SG10 red arrow.

Relay Output 1 is activated by P8 Wait State (ATSC4/PSC2000/QTC) or by Special Output 1 (Eclipse). Both P8 Wait State (P8WS) and Special Output 1 (SO1) are set in the controller personality.

P8WS can be monitored by keying in A.E03BD (PSC2000) or 7 (Diag) > 1 (Mem) > 3BD (Alpha 16/ ATSC4/ QTC) into the controller, or in SCATS Access, Show > Controller > Memory - Page 3, Offset BD (Hex).

SO1 can be monitored by keying in 7 (Diag) > 1 (Mem) > 37A (Eclipse) into the controller, or in SCATS Access, Show > Controller > Memory - Page 3, Offset 7A (Hex).

If OFF-LINE

- clear XSF6, then
- if time > 08:00, Monday to Friday, set P8WS/SO1.
- if time > 18:00, Monday to Friday, clear P8WS/SO1.

If ON-LINE

- clear conditions from hardware clock, then
- if XSF6 is set, set P8WS/SO1.

**UPS ALARM OUTPUTS**

To monitor the state of the UPS operation (Uninterrupted Power Supply unit) connected to this traffic signal controller. Three external inputs in the traffic signal controller software personality constantly monitor the condition of the UPS Alarm outputs. They are as following:

**Detector 22 – Mains Failure**

A 'Mains Failure' alarm is set when the Detector 22 input (UPS contact C1 output) change from a **Normally OFF (N/O)** state to an ON state (ie. short circuit, N/C).

- When Detector 22 input changes state to **ON**, it sets the **MSS10** flag until the external input change state to **OFF** again.
- The MSS10 flag provides information via SCATS to TMC that the UPS has detected a **Mains Failure Alarm**.
- The traffic signal controller is now **Running on Batteries Power** - the UPS unit has switched from 240 volt mains operation to battery power operation.

### **Detector 23 – Battery Low Warning**

A 'Battery Low Warning' alarm is set when Detector 23 input (UPS contact C2 output) changed from a **Normally OFF (N/O)** state to an ON state (ie. short circuit, N/C).

- When Detector 23 input changes state to **ON**, it sets **MSS11** flag until the external input change state to **OFF** again.
- The **MSS11** flag provides information via SCATS to TMC that the UPS has detected a **Battery Low Alarm**.

### **Detector 24 – System Malfunction**

A 'System Malfunction' alarm is set when Detector 24 input (UPS contact C3 output) changed from a **Normally ON (N/C)** state to an OFF state (ie. open circuit, N/O)

- When Detector 24 input changes state to **OFF**, it sets the **MSS12** flag until the external input change state to **ON** again.
- The **MSS12** flag provides information via SCATS to TMC that the UPS has a **System Malfunction Alarm**.

### **SCATS – Variation Routine Action Lists**

The following example SCATS Action Lists need to be set up in each of the SCATS regions that have UPS traffic signals:

#### Action List 600

```
;UPS Alarm – Mains Failure: running on Batteries
;Advise TMC, UPS Alarm – Signals Running on Battery Power
"0 DNC %1 UPS Alarm – Signals Running on Battery Power
I=%1!M1 UPS Alarm– Signals Running on Battery Power (Action List 600)
```

#### Action List 601

```
;UPS Alarm – Battery Low
;Advise TMC, UPS Alarm – UPS Battery Low Alarm
"0 DNC %1 UPS Alarm – UPS Battery Low Alarm
I=%1!M1 UPS Alarm– UPS Battery Low Alarm (Action List 601)
```

#### Action List 602

```
;UPS Alarm – System Malfunction
;Advise TMC, UPS Alarm – UPS System Malfunction
"0 DNC %1 UPS Alarm – UPS System Malfunction
I=%1!M2 UPS Alarm– UPS System Malfunction (Action List 602)
```

#### Action List 603

```
;UPS Alarm - Running on Batteries. Alarm cleared.
;Advise TMC, UPS Alarm Cleared - Signals Running on Battery Power
"0 DNC %1 UPS Alarm Cleared - Signals Running on Battery Power
I=%1!M1
```

#### Action List 604

```
;UPS Alarm - Battery Low. Alarm cleared.
;Advise TMC, UPS Alarm Cleared - UPS Battery Low Alarm.
"0 DNC %1 UPS Alarm Cleared - UPS Battery Low Alarm
I=%1!M1
```

**SITE NAME: McIVOR HWY / MITCHELL ST / VIEW ST**

Action List 605

;UPS Alarm - System Malfunction. Alarm cleared.

;Advise TMC, UPS Alarm Cleared - UPS System Malfunction.

"0 DNC %1 UPS Alarm Cleared - UPS System Malfunction

I=%1!M2

**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	36.0	50	50	50	3.5	2.5	6.0
B	2 → P5	35.5	50	50	50	3.5	2.5	6.0
C	9 → P5	19.0	40	40	40	3.0	2.0	5.0
D	6 → P1	25.0	40	40	40	3.0	2.5	5.5
E	4 → P2	22.0	40	40	40	3.0	2.0	5.0
F	6 → P1	25.0	40	40	40	3.0	2.5	5.5
G	4 → P2	22.0	50	45	45	3.0	2.0	5.0

**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	
1	A	13.5	13	13	10.0	7	7.0		6.0
2	A	13.0	13	13	9.0	6	5.0	1.0	5.0
3	D	16.0	8	16	16.0	11	11.0		5.5
4	D	11.0	8	16	11.0	7	7.0		5.5
5	D	11.0	8	16	11.0	7	7.0		5.5
6	D	18.5	8	16	18.5	12	12.0		5.5

**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			5
MINIMUM GREEN	3	10	4	6	8	6	6	6
INCREMENT	4							
MAXIMUM INITIAL GREEN*	5							
MAXIMUM EXTENSION GREEN	6	35	10	10	20	10	5	10
EARLY CUT OFF	7		3.0		4.0	4.0	4.0	4.0
YELLOW	8	3.5	3.5	3.0	3.0	3.0	3.0	3.0
ALL RED	9	2.5	2.5	2.0	2.5	2.0	2.5	2.0
SPECIAL ALL RED	10							
GAP 1	11	2.5	2.5	0.5	2.5	0.5	2.5	2.5
GAP 2	12	2.5	2.5		2.5	0.5	2.5	2.5
GAP 3	13				2.5			
GAP 4	14				2.5			
HEADWAY 1	15	0.6	1.2	5.0	1.2	5.0	1.2	1.2
HEADWAY 2	16	0.6	0.6		1.2	5.0	1.2	1.2
HEADWAY 3	17				1.2			
HEADWAY 4	18				1.2			
WASTE 1	19	7	7	50	7	50	7	7
WASTE 2	20	7	7		7	50	7	7
WASTE 3	21				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	13.0	13.0	16.0	16.0	16.0	16.0		
CLEARANCE 1	3	7.0	5.0	11.0	7.0	7.0	12.0		
CLEARANCE 2	4		1.0						

\* 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		
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	13	P1 Walk time substitution
10	13	P2 Walk time substitution
11	16	P3 Walk time substitution
12	16	P4 Walk time substitution
13	16	P5 Walk time substitution
14	2	Delay Timer 1: Bus (det 19 & 20)
15	0.5	Delay Timer 2: Bus (det 21 & 22)
16	8	Timer 3: Duration for holding SG9 red in DØ with P5 demand
17	3	Presence time for detector 10
18	0	LIMIT GREEN WATCHDOG TIMER
19	0	SPECIAL FACILITY CONTROLS ALARM TIMER
20	10	ALL RED START UP INTERVAL
21	16	P6 Walk time substitution
22	4	Duration of MSS flag
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
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: 0-15)	DETECTOR No	TIMESETTING (Range: 0-10)
1		25	
2		26	
3		27	
4		28	
5		29	
6		30	
7		31	
8		32	
9		33	
10	1.5	34	
11	0.0	35	
12		36	
13	2.0	37	
14		38	
15		39	
16	3.0	40	
17		41	
18	2.0	42	
19		43	
20	1.0	44	
21		45	
22		46	
23		47	
24		48	

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

NOTE: No support for presence timesettings for dets 25-48

Use presence timesettings for dets 1 - 24 or  
special movement timesettings for dets 1 - 40**DAILY EVENT TIMESETTINGS**

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

DESIGNED BY: NOEL RAVEENDRAN

DATE 17/11/20

**CONTROLLER TIMESETTINGS - 4****SPECIAL MOVEMENT TIMESETTINGS**

GROUP No	STAGE 1 TIMESETTINGS (Yellow Timing)	STAGE 2 TIMESETTINGS (Red Timing)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		

NOTE: Stage 1: Timesetting (Yellow Time)  
 Default is zero, uses phase yellow if special movement is activated  
 Can specify phase timesettings, eg. A phase yellow, or a time value, eg. 3 secs  
 Stage 2: Timesetting (Red Time)  
 Default is zero, Traff will use 2 secs red as default if special movement is activated  
 Can specify phase timesettings or other timesettings, eg. A phase red, or a time value, eg. 2.5 secs

**FLEXILINK OPERATION****PHASE SEQUENCES**

No	PHASE SEQUENCE
1 (No Y+)	ABCDEFGG
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	R-
B	No	R+
C	No	Auto
D	Yes (to E,F,G,A)	Q-
E	Yes (to F,G,A)	Auto
F	Yes (to G,A)	Auto
G	Yes (to A)	Auto

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 C, E, F

**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	Auto introduction of P5 in DØ
Z- Master	
Z+ Flexi	Auto introduction of P1 in AØ & GØ and P2 in AØ
Z+ Master	
R- Flexi	Auto introduction of P3 in BØ, CØ & DØ, P4 in CØ & DØ and P6 in BØ, CØ & DØ
R+ Flexi	
Q- Flexi	
Q+ Flexi	AØ RELEASE PULSE
R- Flexi	
R+ Flexi	
Q- Flexi	BØ RELEASE PULSE
Q+ Flexi	
R- Flexi	DØ RELEASE PULSE
R+ Flexi	
Q- Flexi	P1-P6 Walk Time substitution (refer Special Purpose Timesettings no.s 9-13 & 21)
Q+ Flexi	

**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>	=	7	,	4	,	6
		(phases)		(split plans)		(walks)
INT	=	6200				
VC	=	6				
CS	=					
COM	=	NET				
PK	=	!				
S#	=					
LM	=					
RMN	=	0				
DCL	=	0				
AT	=	6				
BT	=	9				
CT	=	5				
DT	=	10				
ET	=	9				
FT	=	10				
GT	=	9				
W1	=	16A	W1 T	=	13	
W2	=	16	W2 T	=	11	
W3	=	2CD	W3 T	=	17	
W4	=	0DEF*	W4 T	=	13	
W5	=	16	W5 T	=	13	
W6	=	0DEF*	W6 T	=	18	
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	=	0PDFGNGB	A	=	
B	=	10C	B	=	
C	=	10D	C	=	
D	=	30E	D	=	
E	=	10F	E	=	
F	=	10G	F	=	
G	=	10TGA	G	=	

**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	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	25	26	27	28	29	30	31	32
	1			X			X				X							X			X												
	2				X	X		X		X									X	X													
	3	X						X			X	X	X			X																	
	4		X						X								X																
	5		X						X	X							X																
	6	X						X				X	X			X																	
	7		X	X			X			X	X	X	X				X			X	X												
	8				X	X			X										X														
m	9		X			X		X	X											X													
m	10	X		X			X					X	X					X															
	11			X			X	X			X							X			X												
	12			X			X	X			X							X			X												
	13																																
	14																																
P1	15			X			X																										
P2	16				X	X		X																									
P3	17	X									X	X	X																				
P4	18		X						X																								
P5	19		X				X		X																								
P6	20	X					X				X	X																					
	21																																
	22																																
	23																																
	24																																
	25																																
	26																																
	27																																
	28																																
	29																																
	30																																
	31																																
	32																																

CHECKED: Gerald Tamaray DATE: 27/03/18

DESIGNED BY: NOEL RAVEENDRAN

DATE 17/11/20