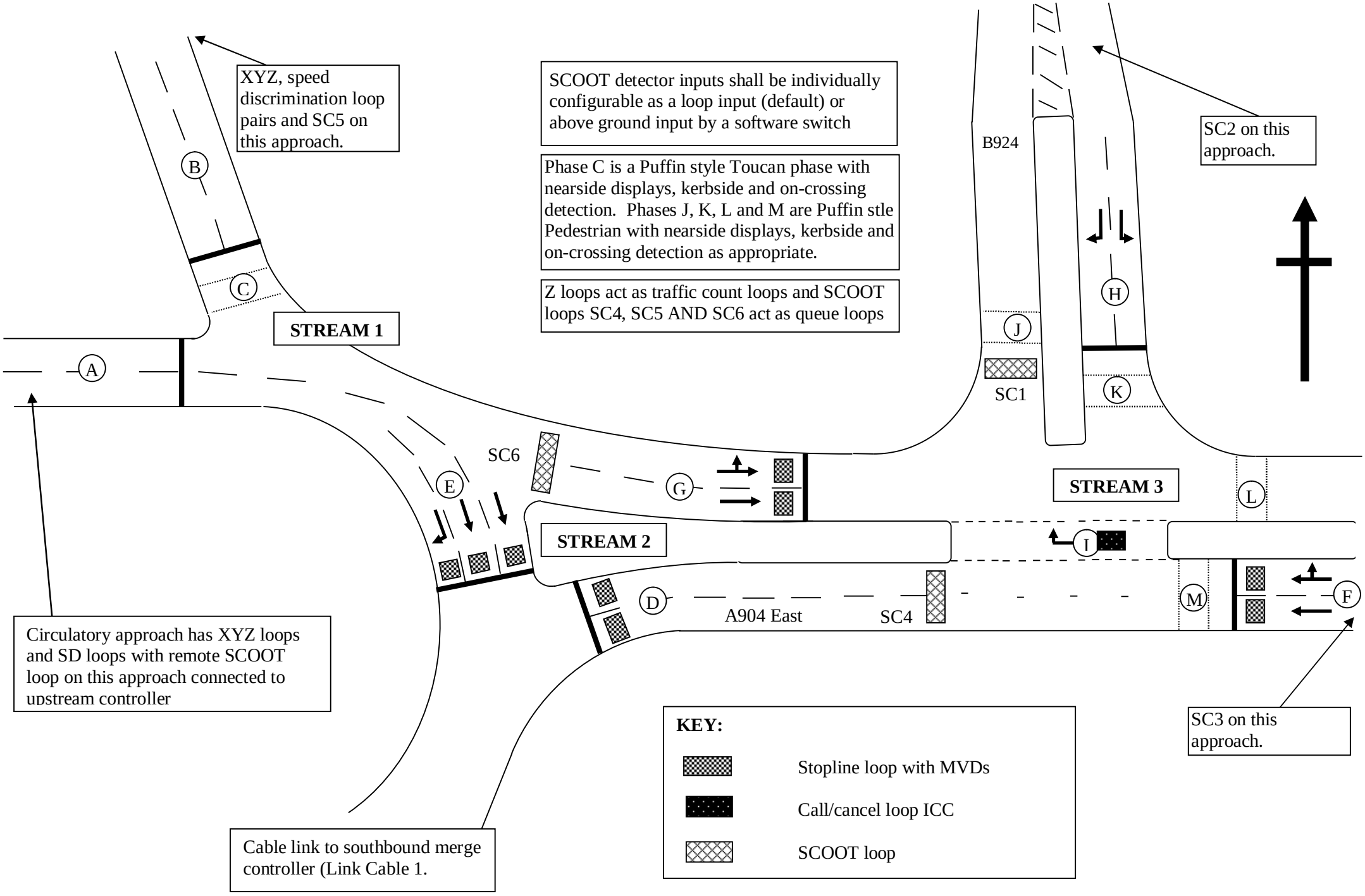
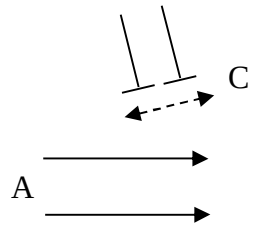
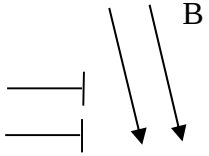
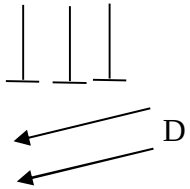
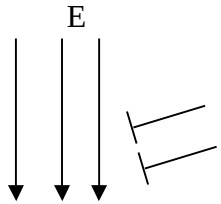
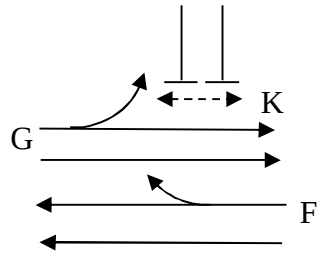
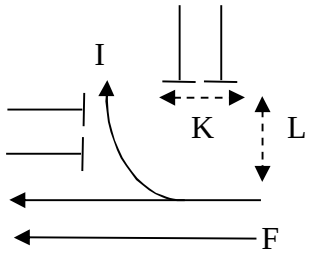
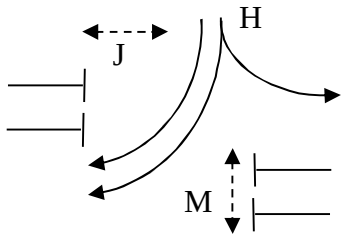
FRC-P-___SRM-21-S-12909

GRONTMIJ

INTERSECTION GENERAL DESCRIPTION: FRC –SQF – Southbound Diverge, Circulatory W/bd Entry A904 East T Junction		
DRAWINGS: FRC_P_SRM-025-D-NT-SIG-12901 and FRC_PSRM-025-D-NT-SIG-12907	**REFERENCE:** TBC	**CONTROLLER SCN:** 2ACC1/2/3 **OTU SCN:** 2AD00
SPECIFICATION COMPRISING: 29 **PAGES**	**CONTROLLER IP ADDRESS:** -	**OTU IP ADDRESS:** 10.25.196.146
CUSTOMER'S ENGINEER: Stein Connelly (0141 300 8243)	**SUBNET:** 255.255.252.0	**GATEWAY:** 10.25.199.254
SPECIFICATION ISSUE: 2.0	**CONTROLLER:** Peek	
SPECIFICATION BY: Peter Routledge (01904 793 666)	**CONTROLLER TYPE:** PTC-1 ELV	
Issue 1.1	As built PR 03.05.18	
MAINS SUPPLY: 230 **V** 50 **Hz**	**DIMMING:** Yes	**DIMMING VOLTAGE** ELV


XYZ, speed discrimination loop pairs and SC5 on this approach.
SCOOT detector inputs shall be individually configurable as a loop input (default) or above ground input by a software switch
Phase C is a Puffin style Toucan phase with nearside displays, kerbside and on-crossing detection. Phases J, K, L and M are Puffin stle Pedestrian with nearside displays, kerbside and on-crossing detection as appropriate.
Z loops act as traffic count loops and SCOOT loops SC4, SC5 AND SC6 act as queue loops
B924
SC2 on this approach.
B
C
STREAM 1
A
H
J
SC1
K
SC6
E
G
STREAM 3
L
STREAM 2
I
D
A904 East
SC4
M
F
Circulatory approach has XYZ loops and SD loops with remote SCOOT loop on this approach connected to upstream controller
Cable link to southbound merge controller (Link Cable 1.
SC3 on this approach.
KEY:
Stopline loop with MVDs
Call/cancel loop ICC
SCOOT loop

STAGING STREAM 1			
Stage 1  Demanded by A or C	**Stage 2**  Demanded by B	**Stage 3** All Red Dummy N	
STAGING STREAM 2			
Stage 4  Demanded by D	**Stage 5**  Demanded by E	**Stage 6** All Red Dummy O	

STAGING STREAM 3			
Stage 7  Demanded by F or G or K	**Stage 8**  Demanded by I or L	**Stage 9**  Demanded by H or J or M	**Stage 10** All Red Dummy P

	STREAM 1	STREAM 2	STREAM 3	STREAM 4
ALL RED	3	6	10	
START UP	1	4	7	
REVERSION	1	4	7	

General Notes

General Notes

1. This is configuration is based on drawing FRC_P_SRM-025-D-NT-SIG-12901 and FRC_P_SRM-025-D-NT-SIG-12907;
2. If the controller supports a Web GUI it shall include (accessible via the 'tree' menu):
   a) An electronic version of this specification (pdf) and the layout/ducting/schedules drawings (pdf); and
   b) A mimic schematic including, as a minimum:
      - Traffic and pedestrian detector inputs that change colour as they go active/inactive;
      - Running stage/ phase(s) (green/red) indication; and
      - Operative mode indication.
3. The site will normally operate under UTC/SCOOT (with demand dependency and gapping out) control with CLF plans in the event of UTC failure and overnight fallback to VA. Fault reporting will be undertaken through UTC;
4. Controller fitted with 9 quad detector packs (including SCOOT loops);
5. Red lamp monitoring for pedestrians plus other lamp monitoring shall be provided;
6. Minimum value for minimum traffic green to be 5 seconds, dummy minimum 0 seconds; pedestrian and IGA minimums 5 seconds, minimum intergreens two seconds less than the working value but 5 seconds minimum;
7. Minimum/maximum extension to be 0.1/10.0 seconds;
8. When a pedestrian/Toucan phase is demanded, only the wait indicators for that phase illuminate; and
9. DFM to flash on safety red lamp fail only.

PUFFIN safety feature

1. To ensure faulty or vandalised kerbside detection cannot prevent pedestrian demands from being serviced, pedestrian demands shall be latched/unlatched as follows:
   - if the kerbside detector is active when the PB is pressed – unlatched; and
   - if the kerbside detector is not active when the PB is pressed – latched and
2. To support the safety feature, pushbuttons and associated kerbside detectors shall be monitored in pairs (except when there are two pushbuttons associated to one kerbside detector) but note once a demand has been accepted it shall be held by any kerbside detector associated with the phase.

PUFFIN Timings

1. On-crossing extension time: on-crossing detectors have a built in extension time of 0.5 seconds. A total extension time of 1.0 seconds is required therefore the controller extension time should be set to 0.5 seconds;
2. Registered demand extension time: 1.0 seconds;
3. Kerbside demand extension time: a value is 1.0 seconds is required but as kerbside detectors have an inbuilt extension of 0.8 seconds, the controller extension time should be set to 0.2 seconds; and
4. With the above, a pedestrian demand shall be cancelled two seconds after the pedestrian departs assuming there is no subsequent kerbside detector demand.

General UTC Operation

1. The controller shall be configured with UTC bits for monitoring and control, including lamp failure bits;
2. Traffic count bits shall be returned to the UTC instation;
3. SCOOT loops shall be connected to the controller and passed onto the OTU. SCOOT inputs initially configured as loops but shall be individually capable of being toggled by a software switch to an above ground detector input; and
4. SC4, SC5 and SC6 also function as queue loops.

PHASE DATA																															
USE OF STAGES				**PERMITTED PHASE COMBINATIONS**																							**TIMINGS**				
DESCRIPTION	**Condition of appearance (1)**	**Condition of termination (2)**		**Type of Phase (3)**	**C indicates conflicting moves**																						**Minimum green**	**MAX SET**			
		Type	**Ass'd Phase**		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**		**A** AM Peak	**B** PM peak	**C** Daytime OP	**D** overnight
A Circulatory Eastbound	0	0		T		C												C						7	30	30	25	20
B Southbound diverge	0	0		T	C		C											C						7	30	30	25	20
C Toucan across Southbound diverge	0	0		TN		C												C						6				
D Westbound Entry	0	0		T					C										C					7	30	30	25	20
E Circulatory Southbound	0	0		T				C											C					7	40	20	20	15
F A904 East Westbound	0	0		T								C		C			C			C				7	30	30	25	20
G A904 East Eastbound	0	0		T								C	C	C		C				C				7	40	30	25	20
H B924 entry	0	0		T						C	C		C		C	C				C				7	20	30	25	20
I A904 East Westbound R/T	0	2	F	I							C	C		C						C				5	15	15	15	10
J Peds across B924 exit	0	0		PU						C	C		C							C				6				
K Peds across B924 entry	0	0		PU								C								C				6				
L Peds across A904 East Eastbound	0	0		PU							C	C								C				6				
M Peds across A904 East Westbound	0	0		PU						C										C				6				
N Stream 1 All Red Dummy	0	0		D	C	C	C																	3				
O Stream 2 All Red Dummy	0	0		D				C	C															3				
P Stream 3 All Red Dummy	0	0		D						C	C	C	C	C	C	C	C							3				
Q																													
R																													
S																													

Note 1: Condition of Appearance	Note 2: Condition of termination	Note 3: Type of Phase	
0 - Phase always appears	0 - Phase terminates at end of stage	T - Traffic	PD - Pedestrian (far side)
1 - Phase appears only if demand exists at start of interstage	1 - Phase terminates when associated phase gains ROW	F - Filter arrow	PU - Puffin
2 - Phase appears, if demanded, at any time up to the end of the stage	2 - Phase terminates when associated phase loses ROW	I - Indicative arrow	TF - Toucan (far side crossing signals)
3 - Phase appears, if demanded, at any time until the window time expires		D - Dummy	TN - Toucan (nearside crossing signals)
4 – Phase always appear in UTC and CLF and demand dependant in other modes		S - Switched sign	PB – Puffin with blackout

PHASE INTERGREENS AND DELAYS (SECONDS)

TO PHASE

FROM PHASE

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
A		5												3					
B	5		5											3					
C		#												#					
D					5										3				
E				5											3				
F								5		10			5			3			
G								7	5	8		9				3			
H						5	5		5		5	9				3			
I							7	5		10						3			
J						#	#		#							#			
K								#								#			
L							#	#								#			
M						#										#			
N	2	2	2																
O				2	2														
P						2	2	2	2	2	2	2	2						
Q																			
R																			
S																			

= See Sheet 9

PHASE DELAYS

No	Delay Phase	From Stage	To Stage	By (Secs)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Starting Intergreen period (excluding amber period) = 10

UTC INTERSTAGE

TO STAGE

FROM STAGE	1	2	3	4	5	6	7	8	9	10
1		a								
2	b									
3										
4					5					
5				5						
6										
7								9	c	
8							*		d	
9							e	*		
10										

Note: The stage intergreen is taken as the largest intergreen between phases in concurrent stages.

* indicates a non-permitted move

a – min = 5s max = 13s
b – min = 5s max = 7s
c – min = 10s max = 12s
d – min = 10s max = 12s
e – min = 5s max = 12s

PEDESTRIAN PHASES – ADDITIONAL DATA

Puffin Pedestrian to Vehicle Intergreen (LTN2/95)

Phase details		Times (seconds)				
Phase	**Road width L (m)**	**Period 5 (Fixed all red)**	**Period 6 (Variable all red)**	**Period 7 (Additional all red after max change)**	**Period 8 (Additional all red after gap change)**	**Max Intergreen After Ped (including starting amber)**
C	9.0	3	8	0	0	13
J	5.0	3	4	0	0	9
K	8.5	3	7	0	0	12
L	8.0	3	7	0	0	12
M	8.0	3	7	0	0	12

Notes:

1. Period 5 + 6 = (L/1.2+ Pc);
2. Period 6 = ((L/1.2 + Pc) – P5) = ((L/1.2+ Pc) – 3 = L/1.2; where
   - L = road width in metres
   - Pc = the pedestrian comfort time = 3 seconds

Phase	Audible	Tactile	Phase	Audible	Tactile
C	No	Yes			
J	No	Yes			
K	No	Yes			
L	No	Yes			
M	No	Yes			

USE OF STAGES

Active Phases (including dummys but excluding regulatory signs)																				Stream
Stage	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	
1	Y		Y																	1
2		Y																		1
3														Y						1
4				Y																2
5					Y															2
6															Y					2
7						Y	Y				Y									3
8									Y		Y	Y								3
9								Y		Y			Y							3
10																Y				3
11																				
12																				
13																				
14																				
15																				
16																				
Max Revertive Demand Phase	A	B		D	E	F	G	H	F											

Fixed Time Mode Stage Sequence								
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Stage**
								Stage No
								Duration

Fixed time running to current maximum	Yes

Demand Dependent Phases in Fixed Time			
A		**J**	
B		**K**	
C		**L**	
D		**M**	
E		**N**	
F		**O**	
G		**P**	
H		**Q**	
I			

Manual Selection

Button	Stages	Description
1	1+4+7	E/bd Circulatory, W/bd Entry and A904 East E/bd and W/bd
2	2+5+8	S/bd Diverge, S/bd Circulatory and A904 East W/bd and W/bd R.T
3	1+4+9	E/bd Circulatory, W/bd Circulatory Entry and B924 S/bd
All Red	3+6+10	

Manual always available
Yes

PROHIBITED/ALTERNATIVE STAGE MOVEMENTS

Streams 1/2/3

Mode	Restrictions
UTC	Yes
CLF	Yes
VA	Yes
FT	See below
Manual	Yes
Priority	-
Emergency	-

From Stage / **To Stage**

	1	2	3	4	5	6	7	8	9	10	Mode
1		Y	X								VA
2	Y		X								
3	Y	Y									
4					Y	X					
5				Y		X					
6				Y	Y						
7								Y	Y	X	
8							*		Y	Y	
9							Y	#		X	
10							Y	Y	Y		

From Stage / **To Stage**

	1	2	3	4	5	6	7	8	9	10	Mode
1		Y	Y								MAN
2	Y		Y								
3	Y	Y									
4					Y	Y					
5				Y		Y					
6				Y	Y						
7								Y	Y	Y	
8							X		Y	Y	
9							Y	X		Y	
10							Y	Y	Y		

KEY:

Y = move permitted
X = move not permitted
* Via all red
\# Via Stage 7

In fixed time controller runs:

- Stages 1+4+7;
- Stags 2+ 5+8;
- Stages 1+4+9; etc

From Stage / **To Stage**

	1	2	3	4	5	6	7	8	9	10	Mode
1		Y	X								FT
2	Y		X								
3	Y	Y									
4					Y	X					
5				Y		X					
6				Y	Y						
7								Y	X	X	
8							X		Y	X	
9							Y	X		X	
10							Y	Y	Y		

From Stage / **To Stage**

	1	2	3	4	5	6	7	8	9	10	Mode
1		Y	X								UTC
2	Y		X								CLF
3	Y	Y									
4					Y	X					
5				Y		X					
6				Y	Y						
7								Y	Y	X	
8							X		Y	X	
9							Y	X		X	
10							Y	Y	Y		

ETECTORS AND PUSH BUTTONS - LOCATIONS AND FUNCTIONS													
Reference/Description			**External**	**Extension**	**Phase**		**Non-latching**	**Uni-directional**	**Call/cancel**		**DFM fail mode/Group**	**Speed detection**	**Special Instructions**
					Demanded	**Extended**			**Call delay (secs)**	**Cancel delay (secs)**			
1.	AX	Pack 1 - 1		1.6	A	A					A1		
2.	AY	Pack 1 - 2		1.6	A	A					A1		
3.	AZ1	Pack 1 - 3		1.6	A	A					A1		Copy for TC1
4.	AZ2	Pack 1 - 4		1.6	A	A					A1		Copy for TC2
5.	BX	Pack 2 - 1		1.6	B	B					A2		
6.	BY	Pack 2 - 2		1.6	B	B					A2		
7.	BZ1	Pack 2 - 3		1.6	B	B					A2		Copy for TC3
8.	BZ2	Pack 2 - 4		1.6	B	B					A2		Copy for TC4
9.	$DSL1_{(NEARSIDE)}$	Pack 3 -1		1.0	D	D					A2		Copy for TC5
10.	$DSL2_{(OFFSIDE)}$	Pack 3 - 2		1.0	D	D					A2		Copy for TC6
11.	$ESL1_{(NEARSIDE)}$	Pack 3 - 3		1.0	E	E					A1		Copy for TC7
12.	$ESL2_{(CENTRE)}$	Pack 3 - 4		1.0	E	E					A1		Copy for TC8
13.	$ESL3_{(OFFSIDE)}$	Pack 4 -1		1.0	E	E					A1		Copy for TC9
14.	$FSL1_{(NEARSIDE)}$	Pack 4 - 2		1.0	F	F					A2		
15.	$FSL2_{(OFFSIDE)}$	Pack 4 - 3		1.0	F	F					A2		
16.	$GSL1_{(NEARSIDE)}$	Pack 4 - 4		1.0	G	G					A1		
17.	$GSL2_{(OFFSIDE)}$	Pack 5 -1		1.0	G	G					A1		
18.	$HSL1_{(NEARSIDE)}$	Pack 5 - 2		1.0	H	H					A3		
19.	$HSL2_{(OFFSIDE)}$	Pack 5 - 3		1.0	H	H					A3		
20.	ICC	Pack 5 - 4		1.0	I	I	Y		3	2	A4		
21.	A1A	Pack 6 - 1									M1		Double speed discrimination speed measuring loop pairs
22.	A1B	Pack 6 - 2									M1		
23.	A2A	Pack 6 - 3									M1		
24.	A2B	Pack 6 - 4									M1		
25.	B1A	Pack 7 - 1									M2		
26.	B1B	Pack 7 - 2									M2		
27.	B2A	Pack 7 - 3									M2		

28.	B2B	Pack 7 - 4									M2		
29.	SC1	Pack 8 - 1									-		SCOOT inputs configured as loops but shall be individually capable of being reset by a software switch to an above ground detector input
30.	SC2	Pack 8 - 2									-		
31.	SC3	Pack 8 - 3									-		
32.	SC4	Pack 8 - 4									-		
33.	SC5	Pack 9 - 1									-		
34.	SC6	Pack 9 - 2									-		
35.	Spare	Pack 9 - 3									-		
36.	Spare	Pack 9 - 4									-		
37.	Q1	-					Y		10	2	M5		Copy of SC4
38.	Q2	-					Y		10	2	M5		Copy of SC5
39.	Q3	-					Y		5	2	M5		Copy of SC6
40.	D_{MVD1}	Pole 21		1.0	D	D					A2		
41.	D_{MVD2}	Pole 22		0.5	D	D					A2		
42.	E_{MVD1}	Pole 21		1.0	E	E					A1		
43.	E_{MVD2}	Pole 25		1.0	E	E					A1		
44.	F_{MVD1}	Pole 14		0.5	F	F					A2		
45.	F_{MVD2}	Pole 16		0.5	F	F					A2		
46.	G_{MVD1}	Pole 1		0.5	G	G					A1		
47.	G_{MVD2}	Pole 20		0.5	G	G					A1		
48.	H_{MVD1}	Pole 6		0.5	H	H					A3		
49.	H_{MVD2}	Pole 8		0.5	H	H					A3		
50.	$C_{PUSH\ BUTTON\ 1}$	Pole 29	Y		C		Y				M6		Pushbuttons
51.	$C_{PUSH\ BUTTON\ 2}$	Pole 30	Y		C		Y				M6		
52.	$C_{PUSH\ BUTTON\ 3}$	Pole 31	Y		C		Y				M6		
53.	$C_{PUSH\ BUTTON\ 4}$	Pole 32	Y		C		Y				M6		
54.	$J_{PUSH\ BUTTON\ 1}$	Pole 2	Y		J		Y				M6		
55.	$J_{PUSH\ BUTTON\ 2}$	Pole 3	Y		J		Y				M6		
56.	$J_{PUSH\ BUTTON\ 3}$	Pole 4	Y		J		Y				M6		
57.	$J_{PUSH\ BUTTON\ 4}$	Pole 5	Y		J		Y				M6		
58.	$K_{PUSH\ BUTTON\ 1}$	Pole 6	Y		K		Y				M6		
59.	$K_{PUSH\ BUTTON\ 2}$	Pole 7	Y		K		Y				M6		
60.	$K_{PUSH\ BUTTON\ 3}$	Pole 8	Y		K		Y				M6		
61.	$K_{PUSH\ BUTTON\ 4}$	Pole 9	Y		K		Y				M6		

62.	$L_{PUSH\ BUTTON\ 1}$	Pole 10	Y		L		Y				M6		
63.	$L_{PUSH\ BUTTON\ 2}$	Pole 11	Y		L		Y				M6		
64.	$L_{PUSH\ BUTTON\ 3}$	Pole 12	Y		L		Y				M6		
65.	$L_{PUSH\ BUTTON\ 4}$	Pole 13	Y		L		Y				M6		
66.	$M_{PUSH\ BUTTON\ 1}$	Pole 14	Y		M		Y				M6		
67.	$M_{PUSH\ BUTTON\ 2}$	Pole 15	Y		M		Y				M6		
68.	$M_{PUSH\ BUTTON\ 3}$	Pole 16	Y		M		Y				M6		
69.	$M_{PUSH\ BUTTON\ 4}$	Pole 17	Y		M		Y				M6		
70.	$C_{ON\text{-}CROSSING\ 1}$	Pole 29	Y	0.5	-						M7		On Crossing Detectors
71.	$C_{ON\text{-}CROSSING\ 2}$	Pole 31	Y	0.5	-						M7		
72.	$J_{ON\text{-}CROSSING\ 1}$	Pole 2	Y	0.5	-						M7		
73.	$J_{ON\text{-}CROSSING\ 2}$	Pole 4	Y	0.5	-						M7		
74.	$K_{ON\text{-}CROSSING\ 1}$	Pole 7	Y	0.5	-						M7		
75.	$K_{ON\text{-}CROSSING\ 2}$	Pole 8	Y	0.5	-						M7		
76.	$L_{ON\text{-}CROSSING\ 1}$	Pole 10	Y	0.5	-						M7		
77.	$L_{ON\text{-}CROSSING\ 2}$	Pole 12	Y	0.5	-						M7		
78.	$M_{ON\text{-}CROSSING\ 1}$	Pole 15	Y	0.5	-						M7		
79.	$M_{ON\text{-}CROSSING\ 2}$	Pole 16	Y	0.5	-						M7		
80.	$C_{KERBSIDE\ 1}$	Pole 30	Y								M8		Kerbside Detection
81.	$C_{KERBSIDE\ 2}$	Pole 31	Y								M8		
82.	$J_{KERBSIDE\ 1}$	Pole 2	Y								M8		
83.	$J_{KERBSIDE\ 2}$	Pole 5	Y								M8		
84.	$K_{KERBSIDE\ 1}$	Pole 6	Y								M8		
85.	$K_{KERBSIDE\ 2}$	Pole 8	Y								M8		
86.	$L_{KERBSIDE\ 1}$	Pole 10	Y								M8		
87.	$L_{KERBSIDE\ 2}$	Pole 13	Y								M8		
88.	$M_{KERBSIDE\ 1}$	Pole 14	Y								M8		
89.	$M_{KERBSIDE\ 2}$	Pole 16	Y								M8		
90.													
91.													
92.													
93.													
94.													
95.													
96.													

Detector type		Group	Active (minutes)	Inactive (hours)
Detector supply voltage		1	30	18
Y = use input on DFM fail		2	30	18
A = force active on DFM fail		3	30	24
I = force inactive on DFM fail		4	30	48
M = monitor input and write to fault log only		5	30	Not monitored
		6	30	Not monitored
		7	30	Not monitored
		8	30	Not monitored

MODE PRIORITY

Mode	Priority
Hurry call	
Priority	
Selected manual	1
UTC	3
Selected FT or VA or CLF	2
CLF	4
VA	5

Facility switch	Not operative
Manual	
FT	
VA	

SPECIAL HURRY CALLS

Ref	Stage	Call input	Cancel input	Ack'd output	Seconds			Notes
					Call delay	Hold	Pre-vent	
1								
2								
3								
4								
5								
6								
7								
8								
9								

MASTER TIME CLOCK AND CLF MODE														
No	**Day type**							**Hour**	**Min**	**Sec**	**Introduce Function**	**Function No**	**Plan/ Parameter**	
	M	**T**	**W**	**T**	**F**	**S**	**S**							
1	Y	Y	Y	Y	Y			07	00	00	Max set A	2	b	**Function**
2	Y	Y	Y	Y	Y			09	30	00	Max set C		b	0 Isolate controller
3	Y	Y	Y	Y	Y			12	00	00	Max set B		b	1 Introduce plan
4	Y	Y	Y	Y	Y			14	00	00	Max set C		b	2 Introduce event/function
5	Y	Y	Y	Y	Y			15	00	00	Max set B		b	
6	Y	Y	Y	Y	Y			19	00	00	Max set C		b	a) switch input/output active/inactive
7	Y	Y	Y	Y	Y			22	00	00	Max set D		b	b) introduce max set
8						Y		08	00	00	Max set A		b	c) switch sign on/off
9						Y		09	30	00	Max set C		b	d) switch stage/phase in/out of cycle
10						Y		12	00	00	Max set B		b	e) switch to/from part time mode
11						Y		14	00	00	Max set C		b	f) extend pedestrian green
12						Y		16	00	00	Max set B		b	g) Introduce/remove loud audible
13						Y		18	00	00	Max set C		b	
14						Y		22	00	00	Max set D		b	
15							Y	09	00	00	Max set A		b	
16							Y	10	00	00	Max set C		b	
17							Y	12	00	00	Max set B		b	
18							Y	14	00	00	Max set C		b	
19							Y	16	00	00	Max set B		b	
20							Y	19	00	00	Max set C		b	
21							Y	21	00	00	Max set D		b	
40	Y	Y	Y	Y	Y			07	00	00	CLF Plan 1	1	1	
41	Y	Y	Y	Y	Y			10	00	00	Isolate	0	0	
42	Y	Y	Y	Y	Y			12	00	00	Isolate	0	0	
43	Y	Y	Y	Y	Y			14	00	00	Isolate	0	0	
44	Y	Y	Y	Y	Y			16	00	00	CLF Plan 3	1	3	
45	Y	Y	Y	Y	Y			19	00	00	Isolate	0	0	
46	Y	Y	Y	Y	Y			20	00	00	Isolate	0	0	
47						Y		08	00	00	CLF Plan 1	1	1	
48						Y		10	00	00	Isolate	0	0	

49						Y		13	00	00	Isolate	0	0	
50						Y		16	00	00	CLF Plan 3	1	3	
51						Y		18	00	00	Isolate	0	0	
52						Y		20	00	00	Isolate	0	0	
53							Y	09	00	00	CLF Plan 1	1	1	
54							Y	11	00	00	Isolate	1	1	
55							Y	12	00	00	Isolate	0	0	
56							Y	16	00	00	CLF Plan 3	1	3	
57							Y	18	00	00	Isolate	0	0	
58							Y	20	00	00	Isolate	0	0	

CLF MODE - INFLUENCE SETS

Plan Number	1	**Stream**	1/2/3
Group	**Time**	**Group Influence**	**Related Stage/Stream**
1.	14	PE	2
2.	24	F	2
3.	51	PE	1
4.	61	F	1
5.	82	PE	2
6.	92	F	2
7.	119	PE	1
8.	129	F	1
9.	20	PE	5
10.	30	F	5
11.	57	PE	4
12.	66	F	4
13.	88	PE	5
14.	98	F	5
15.	125	PE	4
16.	135	F	4
17.	94	PE	8
18.	99	DD	8
19.	115	F	9
20.	2	PE	7
21.	7	F	7
22.	29	PE	8
23.	34	DD	8
24.	50	F	9
25.	72	PE	7

Plan Number	3	**Stream**	1/2/3
Group	**Time**	**Group Influence**	**Related Stage/Stream**
1.	14	PE	2
2.	24	F	2
3.	51	PE	1
4.	61	F	1
5.	82	PE	2
6.	92	F	2
7.	115	PE	1
8.	129	F	1
9.	20	PE	5
10.	30	F	5
11.	57	PE	4
12.	66	F	4
13.	88	PE	5
14.	98	F	5
15.	125	PE	4
16.	135	F	4
17.	94	PE	8
18.	99	DD	8
19.	115	F	9
20.	134	PE	7
21.	2	F	7
22.	29	PE	8
23.	34	DD	8
24.	50	F	9
25.	67	PE	7

26.	77	F	7
27.	36	H	
28.	101	H	
29.			
30.			
Cycle Time	136 **seconds**	**Offset** 0 seconds	

26.	77	F	7
27.	36	H	
28.	101	H	
29.			
30.			
Cycle Time	136 **seconds**	**Offset** 0 seconds	

I	Isolate to local VA
F	Immediate move to defined stage
DD	Demand dependent move to defined stage

H	Hold
PE	Prevent moves except to defined stage

CLF MODE - INFLUENCE SETS

Plan Number	4,7	Stream	1
Group	**Time**	**Group Influence**	**Related Stage/Stream**
31.	14	PE	2/1
32.	24	F	2/1
33.	51	PE	1/1
34.	61	F	1/1
35.	82	PE	2/1
36.	92	F	2/1
37.	129	PE	1/1
38.	139	F	1/1
39.	14	PE	2/2
40.	24	F	2/2
41.	51	PE	1/2
42.	61	F	1/2
43.	82	PE	2/2
44.	92	F	2/2
45.	115	PE	1/2
46.	125	F	1/2
47.	18	PE	2/3
48.	23	DD	2/3
49.	25	F	3/3
50.	59	PE	1/3
51.	64	F	1/3
52.	86	PE	2/3
53.	91	DD	2/3
54.	93	F	3/3
55.	127	PE	1/3
56.	132	F	1/3
57.			
58.			

Plan Number	2,5,8	Stream	1
Group	**Time**	**Group Influence**	**Related Stage**
31.	17	PE	2/1
32.	27	F	2/1
33.	51	PE	1/1
34.	61	F	1/1
35.	85	PE	2/1
36.	95	F	2/1
37.	129	PE	1/1
38.	139	F	1/1
39.	22	PE	2/2
40.	32	F	2/2
41.	47	PE	1/2
42.	57	F	1/2
43.	82	PE	2/2
44.	92	F	2/2
45.	115	PE	1/2
46.	125	F	1/2
47.	18	PE	2/3
48.	23	DD	2/3
49.	25	F	3/3
50.	59	PE	1/3
51.	64	F	1/3
52.	86	PE	2/3
53.	91	DD	2/3
54.	93	F	3/3
55.	127	PE	1/3
56.	132	F	1/3
57.			
58.			

59.			
60.			
Cycle Time	136 **seconds**	**Offset** 0 seconds	

59.			
60.			
Cycle Time	136 **seconds**	**Offset** 0 seconds	

I	Isolate to local VA
F	Immediate move to defined stage
DD	Demand dependent move to defined stage

H	Hold
PE	Prevent moves except to defined stage

CLF MODE - INFLUENCE SETS

Plan Number	6, 9	Stream	1
Group	**Time**	**Group Influence**	**Related Stage**
1.	17	PE	2/1
2.	27	F	2/1
3.	51	PE	1/1
4.	61	F	1/1
5.	85	PE	2/1
6.	95	F	2/1
7.	129	PE	1/1
8.	139	F	1/1
9.	22	PE	2/2
10.	32	F	2/2
11.	47	PE	1/2
12.	57	F	1/2
13.	82	PE	2/2
14.	92	F	2/2
15.	115	PE	1/2
16.	125	F	1/2
17.	18	PE	2/3
18.	23	DD	2/3
19.	25	F	3/3
20.	59	PE	1/3
21.	64	F	1/3
22.	86	PE	2/3
23.	91	DD	2/3
24.	93	F	3/3
25.	127	PE	1/3
26.	132	F	1/3
27.			
28.			

Plan Number		Stream	
Group	**Time**	**Group Influence**	**Related Stage**
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.					29.			
30.					30.			
Cycle Time	136 **seconds**	**Offset** 0 seconds			**Cycle Time**	**seconds**	**Offset** seconds	

I	Isolate to local VA	**H**	Hold
F	Immediate move to defined stage	**PE**	Prevent moves except to defined stage
DD	Demand dependent move to defined stage		

UTC CONTROL AND REPLY BITS

Southbound Diverge

Bit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Control	F1	F2*	F4	F5*	F7	F8*	F9*	DX	D2	D5	D8	D9	GO		TS	
Reply	G1	G2	G4	G5	G7	G8	G9	DF	DR2	DR5	DR8	DR9	CF	RR	TSR	MC
Bit	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
Control																
Reply	SC1	SC2	SC3	SC4	SC5	SC6	SC1	_	LF	RF1	RF2	Q1	Q2	Q3	TC1	TC2
Bit	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Control	F1	F2	DX	D2			TS									
Reply	G1	G2	DF	DR2	CF	RR	TSR	MC	LF	RF1	RF2	Q1	TC3	TC4	TC5	TC6
Bit	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**
Control	_	_	_	_			_									
Reply	_	_	_	_	_	_	_	_	_	_	_	_	TC7	TC8	RMS	_

* indicates demand dependant force;

Relationship of phase demands to D bits

D2	D5	D8	D9
B	E	I	H
		L	J
			M

Link Cable Allocation

	Cable 1+2 – Southbound Merge

Notes:

1. OTU type to be Dynniq Chameleon;
2. UTC control required when force bit(s) present;
3. DX demands all phases;
4. GO is the Gap Out bit;
5. TS and TSR times to be confirmed;
6. CF to reply on any fault log entry except a detector fault;
7. RF1 is first red fail, RF2 second red fail and LF is any lamp fail
8. SC'x' are SCOOT reply bits; and
9. Q'x' are queue reply bits

Traffic Flow data

a) TC'x' are traffic flow count bits – see detector sheets; and

b) A reply bit shall be created and returned every fourth vehicle, i.e. on the fourth change of state.

Reply bit options

	G1/G2	MC	Remote reconnect	DF	CF	Other
Manual mode selected and operative		Y	Y			
Manual mode selected			Y			
No lamp power and/or signal off	Y					
Controller fault					Y	
Detector fault				Y		
FT or VA mode selected			Y			

UTC Notes Continued

Ramp Metering Replies

1. Ramp metering on bits are received from the two merge controllers connected to this controller via links cables
2. RMS is S/bd Merge

LINK CABLE SCHEDULE

Link Cable Ref	Core Allocation																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	F1	F2	DX	D2			TS													
2	G1	G2	DF	DR2	CF	RR	TSR	MC	LF	RF1	RF2	RMS	SC1	Q1						

Notes:

1) Link cables 1+2 go to Southbound merge controller

	Control
	Reply
	Spare

SPEED DISCRIMINATION/SPEED ASSESSMENT

Equipment Type: SDE
Number as assessors:
Assessor loop spacing Standard - 12feet/3.66m

* Indicate if phase terminating with non high speed extension is not to have an extra intergreen

Assessor	Associated Phase	Assessor Type
0	A	1
1	A	1
2	B	1
3	B	1
4		
5		
6		
7		

Phase terminated	Extra intergreen	*
A	2	Required
B	2	Required
C		
D		
E		
F		
G		
H		

Assessor Types:
1 = Double SDE (Threshold 30mph, extension 3.0 seconds)
2 = Inner assessor for triple SDE (Threshold 35mph, extension 3.5 seconds)
3 = Outer assessor for triple SDE (Threshold 45mph, extension 3.5 seconds)
4 = Speed assessment (Threshold 28mph, extension 5 seconds)

Notes:

1. If an XYZ loop or speed discrimination loop pair loop is declared faulty then the intergreen for the associated approach shall be increased by 2 seconds (note when this is the case for XYZ loops no further speed related intergreen extensions shall be implemented). If the faulty loop is switched off in software the additional intergreen shall not apply

RED LAMP MONITOR EXTEND INTERGREEN FACILITY

To Phase

From Phase

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
A	■																
B		■	Y														
C			■														
D				■													
E					■												
F						■				Y			Y				
G							■			Y		Y					
H								■			Y	Y					
I									■								
J										■							
K											■						
L												■					
M													■				
N														■			
O															■		
P																■	
Q																	■

LMU extend intergreen timings (Seconds)

	Stream			
	1	**2**	**3**	**4**
Supplementary intergreen	2*			
Maximum all red time	10			

* adjustable in handset in range 0-9 seconds

SPECIAL CONDITIONS FOR STAGE CHANGES – MODE VA				
From	**To**	**Demanded by**	**Running stage extended by**	**Inhibited by demand for**
1	2	Dem B	Ext A	-
2	1	Dem (A or C)	Ext A	-
4	5	Dem E	Ext D	-
5	4	Dem D	Ext E	-
7	8	Dem (I or L)	Ext G	-
	9	Dem H or J or M	Ext F or G	Dem (I or L)
8	9	Dem H or J or M	Ext F or I	-
	7	Dem G		Dem H or J or M
9	7	Dem F or G or K	Ext H	-
	8	Dem I or L		Dem F or G or K

Notes:
a) Conditions for reversion not shown; and
b) Minimums not shown.

SPECIAL CONDITIONS FOR STAGE CHANGES – MODE UTC				
From	**To**			**Condition for Change**
1	2	[F2 & (D2 or Dem B)]	or	[(F1 & F2) & (D2 or Dem B) & -ext A & GO]
2	1	[F1]	or	[(F2 & F1) & -ext B & GO]
4	5	[F5 & (D5 or Dem E)]	or	[(F4 & F5) & (D5 or Dem E) & -ext D & GO]
5	4	[F4]	or	[(F5 & F4) & -ext E & GO]
7	8	[F8 & (D8 or Dem (I or L))]	or	[(F7 & F8) & (D8 or Dem (I or L)) & -ext G & GO]
	9	[F9 & (D9 or Dem (H or J or M))]	or	[(F7 & F9) & (D9 or Dem (H or J or M)) & -ext (F or G) & GO]
8	9	[F9 & (D9 or Dem (H or J or M))]	or	[(F8 & F9) & (D9 or Dem (H or J or M)) & -ext (F or I) & GO]
9	7	[F7]	or	[(F9 & F7) & -ext H & GO]

SPECIAL CONDITIONS FOR STAGE CHANGES – MODE CLF
To be based on UTC conditions